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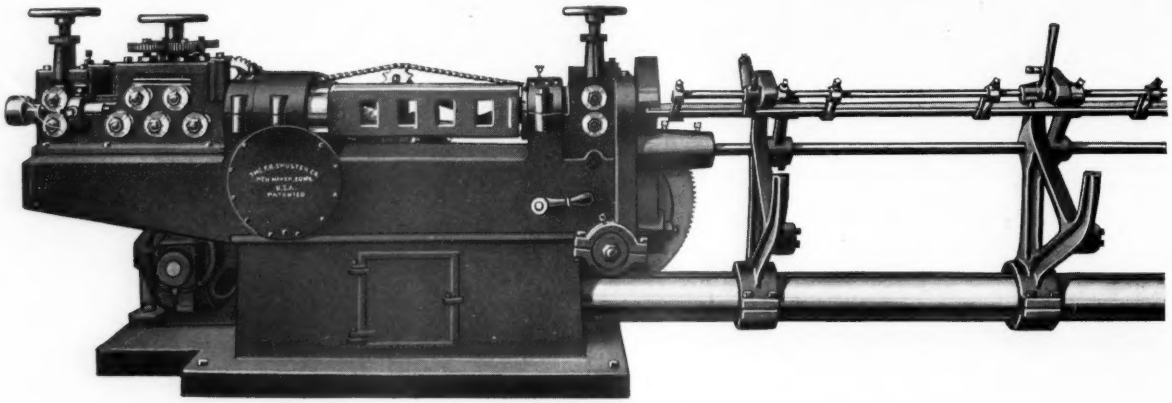

Direct Motor Driven Type
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Makes the wire PERFECTLY STRAIGHT and cuts lengths which are ABSOLUTELY ACCURATE.

Operating costs are extremely low, because adjustments are so simple an ordinary laborer can take care of one, or more, with most of his time free for other work.

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Booklet of Installation and Production Figures will be sent on request.

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Formerly John Adt & Son *STRAIGHTENER SPECIALISTS* **Established 1866**

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THOMASTON, CONN.

THE end of the year is a good time to look back; also consider what the new year may bring. In wire there have been some surprising developments and each bids fair to continue its influences through 1930 and well into 1931. The new hard metal dies, as tungsten carbide, bring greater capacity, more speed, other advantages; as machinery firms rebuild their units to take full advantage of these qualities, plant production goes up, movement of material is speeded, costs are lowered, sales field is widened. With stronger, faster machines there come new needs for different raw materials, more deft workmen or new and better methods of handling the wire before and after drawing. These in turn call for something different but better, faster or cheaper. So the cycle continues.

* * *

The rolling mill tendency is toward lighter, faster units with greater use of new stronger metals in the machinery itself. Such units move wire bars out faster, at lower cost with smaller investments. More equipment is automatic; a contemporary foresees the day when a couple of men will operate a whole rolling mill. Regardless of that dream every time labor is replaced by automatic machines, wire is produced better and cheaper, making it easier to sell.

* * *

Wider uses of duralumin, magnesium and beryllium light alloys, coating of steel with aluminum, and the introduction of other new metals and combinations will have influences on wire work, perhaps with resultant big changes in machinery, equipment, methods or use of men. Are you abreast of the times?

* * *

We are always glad to answer questions relating to wire. Let us help you with your problems.

The Editor.

WIRE & WIRE PRODUCTS

A monthly publication devoted to wire drawing and wire forming

Vol. 4 December, 1929 No. 12

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NEW YORK

WIRE & WIRE PRODUCTS

Vol. 4 · DECEMBER, 1929 No. 12

A Few Thoughts on Galvanizing

Chemicals and Materials Involved--Deep Kettle Installations - Positive Control of Coating Thickness

W. H. Spowers, Jr.

Consulting Engineer on Galvanizing Wickwire Spencer Steel Co., Pittsburg Steel Co.

REMARKABLE progress has been made in galvanizing wire since last writing not only in straight wire but in wire cloth and chain link fabric galvanized after weaving. Not only have great economies in residuum losses been effected but quality of product has reached a high level and production rates have been established on a much more satisfactory basis.

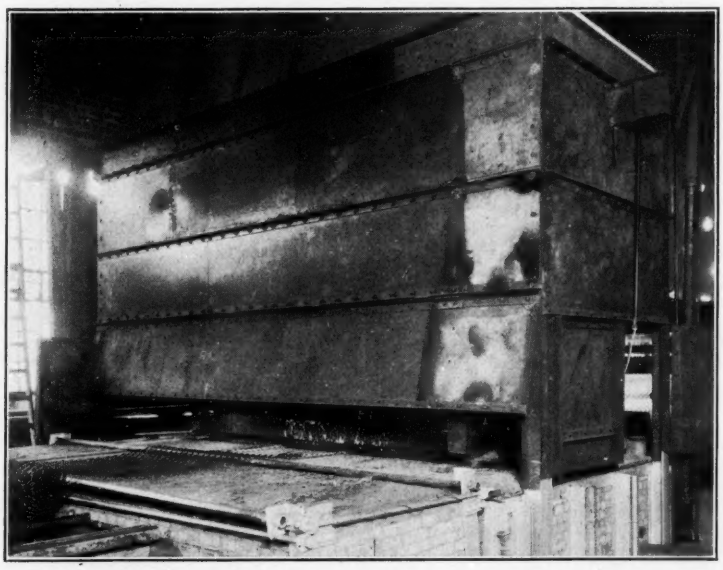
Many established practices in this field have given way to more modern methods not only in installation design but in the handling of the chemicals involved. The process of applying zinc by the hot dip method is traceable from its early discovery, through the empirical state from which it has now emerged to be recognized as distinctive division of metallurgy, based on a wider understanding of the particular problems of the art.

The value of galvanizing in pure zinc uncontaminated by dross has proven itself beyond question and the coatings resulting from pure zinc application have shown markedly superior qualities.

Trend Toward Deep Kettle Installations

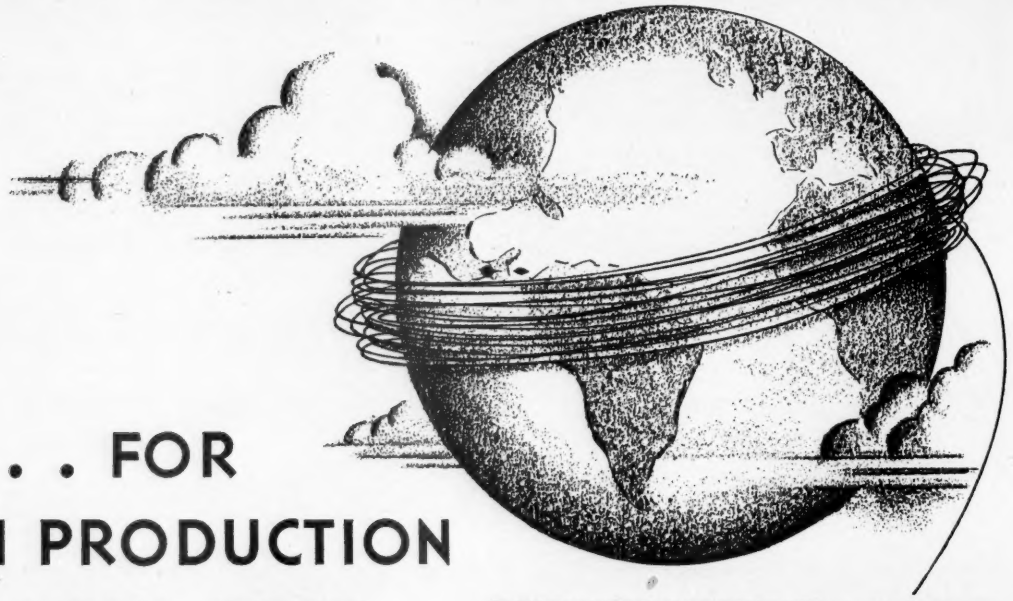
In the straight wire field the trend is distinctly in favor of deep kettle installations designed in such a manner as to not only permit but to assist the natural inclination of the dross to seek the bottom of the kettle. In shallow underfired pans or kettles improperly side-fired a boiling effect on the dross is always present eliminating the possibility of obtaining anything but a drossy coat.

The effect of drossy coatings on wire is not satisfactory from a corrosion resisting point of view. The effect of drossy coatings is disastrous from a bending standpoint and boiling dross is positively uneconomical from the point of view of dross accumulation and kettle life. The change-over from shallow pan operation to a deep kettle in one wire operation under the writer's supervision resulted in a saving in dross accumulation of 50%. It is well to note at this point that the perfection of



An installation for chain fabric, an excellent example of the modern trend

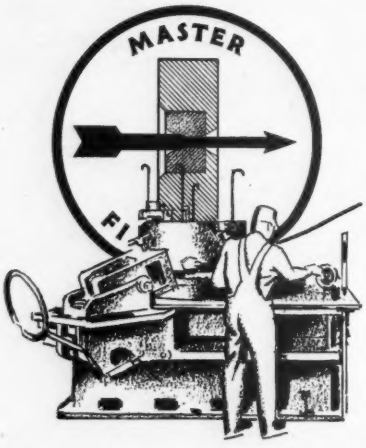
FIRTHALOY DIES



. . . . . FOR HIGH PRODUCTION AND LOW COST . .

TUNGSTEN CARBIDE! What man in the production end of industry has not heard of the wonders performed by this new tool material which approaches the diamond in hardness?

And now Tungsten Carbide is being used in dies for wire drawing, extrusion and other drawing purposes. The new MASTER DIES have nibs made of FIRTHALOY*, a new Tungsten Carbide manufactured by the FIRTH-STERLING STEEL COMPANY.



A new patented design, evolved after three years of experimentation, eliminates shouldering and facilitates proper lubrication. The nibs are accurately fitted into heat treated stainless steel casings and the entire die is made by mechanical means, thus avoiding the uncertainty of the personal element.

With these features, MASTER FIRTHALOY DIES have a useful life many times that of any other metal wire drawing die in existence.

MASTER FIRTHALOY DIES are furnished in all the standard sizes shown in price lists that will be furnished on application.

*FIRTHALOY is a new name for DIMONDITE. The latter name was discontinued, although the Patent Office permitted its registry, when it was discovered that it was in prior use by a tool manufacturer who had not registered the name.

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408 CONCORD AVENUE, NEW YORK, N. Y.

"Anti-Oxide" has practically eliminated the formation of zinc skimmings in the straight wire field.

Positive Control of Coating Necessary

More positive control of weight of coating in the case of straight wire galvanizing has also seen its quota of discussion of late. It has never been a simple matter to control asbestos-wiped wire with the lever type of clamp and recently an interesting type of bobbin wipe has been developed. This employs asbestos cord in such a manner as to effectively govern the grip of the wipe on the wire. It also has the advantage of completely surrounding the wire with the same pressure, thus eliminating any ridging effect so common in the clamp type.

In each of these problems, dross formation, quality of coating, tightness of bond and weight of coating, the deep kettle installed in such a manner as to eliminate boiling has been of tremendous assistance.

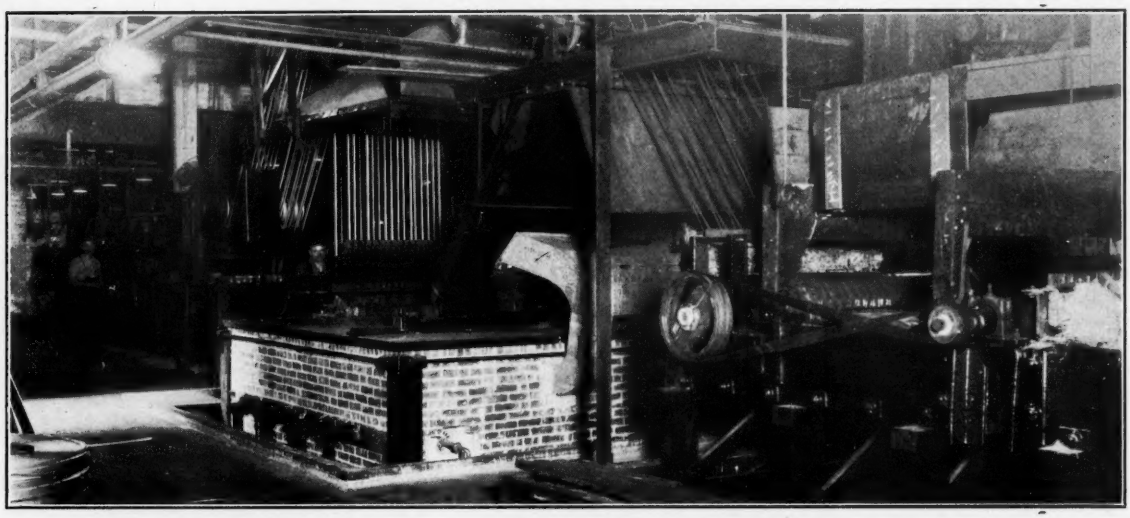
After obtaining the pure zinc coat by this means we still have the length of immersion to think of. It is an established fact that any article after immersion in the zinc is ready for withdrawal the instant it has attained the same temperature as the zinc and the surrounding layer of chilled zinc produced by the cold immersion, has again become fluid. The instant this condition has been accomplished the article, whatever it may be, should be promptly removed from the zinc. To allow the work to remain in the zinc past this point will result in:—First, prolonging the alloying action between the iron and the zinc resulting in poor bond. Second, makes control of weight difficult to attain. Third, produces additional dross. Fourth, retards production.

Straight Wire Work Favors Short Kettles

So by this token modern practice in straight wire tends also to shorter as well as deep kettles. It will be noted that each step we have taken makes for lower costs not only in residuum manufacture but in cost of equipment maintenance not to speak of the more desirable results in quality of product and production.

All the foregoing remarks, except, in so far as they pertain to wipes, apply with equal if not greater force to the galvanizing of hardware cloth, poultry netting and chain-link fabric. In these cases the necessity of passing the work through pure zinc and eliminating the floating dross is doubly necessary. A saving of over 50% in dross by proper installation is not only not unusual but quite the order of the day.

The increasing use of road guard of the chain link type has greatly enlarged this field and one of the greatest problems has been the wipes and mechanical take-outs. The perfection and use of neutral fluxes here has greatly aided in achieving a pleasing and economical result. The total elimination of muriatic acid has resulted in a greatly improved product, a smoother and more pliable coat and a further reduction in dross. Forsaking sal ammoniac entirely has played also no small part in economy. The writer does not use this material in any galvanizing plant under his supervision whether it be pipe, boilers, castings, angles or wire.



An interesting installation for bands showing the modern application of the deep-kettle, short-immersion practice

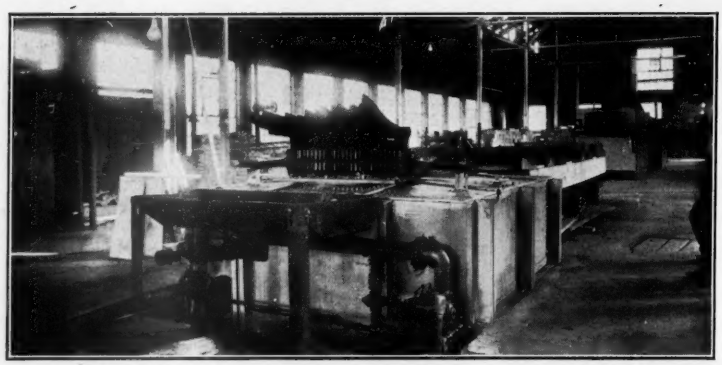
Modern Practice Controls Finish, Too

Modern practice has also achieved a more accurate control of the finish of the wire. Proper fluxing of the zinc itself plays an important part. Temperature of the zinc and the use of the proper type of quench is absolutely essential in order to attain the desired finish. Care must be exercised in these matters, however, so as to avoid interfering with the bond on the wire.

It must be said in any of these wire operations that too much

care cannot be exercised in the constant control of the entire operation from the cleaning to final reeling. If the process is not uniform and absolutely constant the results cannot be uniform. Temperature and strengths of the acid, water and flux must be constant, the temperature and condition of the zinc must be uniform. If any of these operations is allowed to vary at any time the result will not be standard.

Exhaustive experiments in types and grades of zinc have been of great importance and have been productive of interesting results in the wire field. Ordering zinc by the usual "Prime Western" specification will result in as many different results almost as there are brands. The wire field in galvanizing seems to be particularly touchy in so far as zinc is concerned. The writer recently conducted experiments at great length on three very fine brands of zinc with results conclusively different in each case. Had a dozen brands been used it would not have been surprising if twelve different results were found. Wedding one or two particular brands certainly seems to be necessary in galvanizing wire if uniform results are to be attained.



The same installation as below showing the out-go and control mechanism for the oil valves

German Tests of Acids During Pickling

ARGUMENTS as to the relative merits of HCl and H_2SO_4 for pickling steel are summarized by Dr. Fritz Eisenkolf in *Stahl und Eisen*. Hydrochloric acid etches more rapidly and more cleanly operates effectively at a lower temperature and leaves a residue which does not react with ammonium cloride or zinc chloride. Disadvantages are the necessity for special containers (pottery or glass), low content of acid per unit weight, and the harmful vapors coming from the bath. Furthermore, the ferric chloride formed increases the action on the steel. It should also be pointed out that the waste liquors are useless and their annihilation is therefore a matter of considerable expense.

In the case of sulphuric acid, favorable factors are its high degree of concentration, absence of noxious fumes, and the retardation of attack by formation of sulphate of iron. Baths may thus be used nearly to the saturation point. On the other hand the bath must be heated to give sufficiently rapid action. The cleansing action is not so marked due to the lower solubility of oxides than in HCl. Baths which have been long in use tend to deposit sulphate crystals when cooled down and these must be removed by washing.

Most harmful of impurities in

(*Please turn to page 419*)

Showing the in-go end of a modern deep-kettle installation for straight wire.

Galvanic Zinc Coating of Wire

Process and Equipment—Capacity and Resulting Quality How Current Is Transmitted—Use of Addition Agents

By Karl Schuch

Translated from Chemiker-Zeitung by Paul W. Weuller

GALVANIC zinc coating has gained in importance during recent years. Galvanization is preferred to hot-zinc coating, because it renders the coatings purer and more resistant to corrosion. In addition, it is cheaper than hot plating. The wire runs automatically at uniform speed through the pickling, cleaning, scrubbing, and drying vats. The movement of the wire is facilitated by two rows of rollers, one above, and one below the wire. The upper rollers are of metal and transmit the galvanizing current to the wire. These are propelled by worm gears. The lower rollers are made of some insulating material, such as porcelain or glass, and are driven from the upper rollers. The wire runs off a spool and into a pickling solution or electrolytic cleansing bath and then passes into a rinsing apparatus which sometimes contains a scrubbing device; from the rinsing apparatus, it dips into a washing device and then continues into the zinc coating bath. The zincing vat measures from 8 to 15 m. in length. Upon leaving the zinc coating bath, the wire passes through rinsing and drying apparatus, and finally, is spooled. The galvanized wire is now ready for shipment.

Modern Outfits Handle 50 Wires

Modern zinc coating outfits provide for the simultaneous handling of 50 to 60 wires. The length of a complete outfit varies between 35 and 40 m. The modern method utilizes special annealing ovens for the treatment of steel wire. These leave a very thin oxide layer on the wire, thus simplifying the pickling and decarbonizing process. The length of these ovens varies between 10 and 15 m; they are usually installed alongside of the galvanizing vats and operate on generator gas. The wire when passing through the oven, is brought to red-heat temperatures. The pickling vat (6 to 8 m. in length) stands about 1 to 3 m. away from the oven. Burned clay, lead-lined wood (the thickness of the lining varies between 3 and 4 mm), or acid-resisting mortar serve as building materials for the pickling vats. The pickling solution consists of diluted and slightly warmed sulphuric acid (ratio 1:5). The warming of the bath (temperature: 40-50 deg. C.) is facilitated by lead pipe spirals that are steam heated. The wire in the pickling bath is guided by rollers of porcelain or any other acid-resisting material.

The wire can be run automatically through the pickling solution if the oxide layer is very thin; thicker oxide layers, naturally, require longer pickling. It is advisable to treat the wire which needs prolonged pickling in a special department. Cold-drawn wire (in fact, all wire less than 1.5 mm dia.), however, is simply bundled loosely, and then pickled, annealed, and dried in an annealing trough. Pre-pickled or annealed wire, instead of being treated with the ordinary pickling solution, may be cleansed electrolytically; a 30-40% solution of dilute sulphuric acid, sodium sulphate, and sodium chloride is used for this purpose.

Hydrogen, the Cleaning Agent

The case in hand, requires that the current rollers be connected with the minus pole; steel or lead strips serve as anodes; five to eight wires require two rows of anodes; these rows run parallel to the wires. The operation takes place under a 5-volt current, 4-6 amp. per dm^2 The intensively-generated hydrogen soon cleanses the wire without injuring its substance. Cathodic pickling of iron wire is dangerous, because the intensely-generated hydrogen makes the wire brittle. Hence, a neutral electrolyte or anodic current should be used. The wire, upon leaving the pickling vat, enters the cleansing bath which consists of a solution of boiling caustic soda and removes the last remnants of grease.

The prepared wire is spooled, travels through a rinsing vat filled with water, and enters the zincing bath free of all grease. The length of the vat varies between 10 and 15 m. Two sets of rollers that usually are not submerged, carry the wire through the bath. Small metal rollers that supply the current, lead the wire to the guide rollers (not submerged) which are of such a diameter as will permit the wire itself to become fully submerged. The guide-rollers consist of non-conductive materials. The wire should move at least 5 to 8 cm. below the surface of the bath. Zinc strips serve as anodes; five to ten individual wires can run between two rows of anodes.

Safety Screens Are Desirable

The installation of safety screens between wires and anodes is advised for reasons of economy. Such screens make impossible short circuits, that otherwise result every now and than from a torn wire, they also minimize the distance between the electrodes, which, in turn, means more thorough utilization of the current and quicker decanting. The operation takes place under a 5-volt current, 15 amp. per dm^2 for wire of medium diameter. The speed with which the wire travels through the bath depends upon the wire

(*Please turn to page 419*)

Economics of Industrial Heating Practice

All Fuels Have a Best Field of Application--- Fuel Oil, Various Gases, Solid Fuels, Electricity

By J. A. Doyle *

CONTROLLING economic factors in the industrial heating problem are the quality and overall cost of the heat-treated product; working conditions for the operatives; and the influence of the heat-treating process upon the operation of the plant as a whole.

Better and cheaper heat-treated product is the result actually sought by the manufacturer. His problem is really not one of comparing the alleged relative "cost", or so-called "efficiency" of electricity, gas, oil or coal, but, rather, that of determining the relative suitability of the different forms of heat energy, **with heating equipment of proper design,** to specific manufacturing conditions; and the overall economic value of the operation as a whole. The result is influenced by many intangible factors that are not properly recognized in the text books, trade literature, or the usual technical discussion.

The accepted thermal standards of efficiency and economy are but contributing factors. A misinterpretation of the actual relation of such thermal factors to the underlying economic factors is responsible for much of the confusion and misunderstanding that clouds the real issue, retards progress and results in astounding economic waste. Among such contributing thermal factors may be included the relative prices of fuel or electricity; temperature control; heat balance; comparative fuel values on a b. t. u. basis; so-called relative "fuel efficiency"; and an unending multitude of "talking points" that represent more in the form of technical propaganda than economic facts.

No Fuel Monopolizes Efficiency

The notion that any one form of fuel or electricity or heating equipment has a monopoly on efficiency or economy in industrial heating practice, is an economic fallacy. Each has its limitations and field of usefulness, as a matter of fact. Their economic relation is tested by the thermal and mechanical characteristics of heating equipment properly adapted to each, and the suitability of that equipment to a given production requirement. Their relation is not fixed by the price, and continually varies with development of new designs of heating equipment.

Roughly, comparisons in the industrial heating field may be made along the lines accepted in the field of illumination in which the relation is determined by judging the relative merits of different forms of lamps adapted to the specific requirement; not by the senseless, abstract comparison of fuels and electricity, without qualification as to the nature of the heating equipment and the manner of its use, that is so prevalent in industrial heating practice. Other precedents in domestic heating power and transportation could well be considered in an effort to establish a sound economic foundation for the work of the future, by removing the debris of tradition, unsound technology and high pressure sales methods that confuse the manufacturer and hinder progress toward better and broader fields.

The "technical sectarianism" reflecting the Bourbon-like attitude of enthusiastic die-hard advocates of any one form of fuel or electricity, without regard to other essential economic factors, warrants the assumption that the fundamentalists of evolution, or prohibition, have common grounds upon which to meet these brethren, the "technical fundamentalists", who profess the intention of viewing the industrial heating situation with an open mind that, in effect, is open at both ends. The performance is the equivalent of riding on a technical merry-go-round that gets—no where.

Manufacturers Must Take Own Medicine

The fuel oil advocate who uses an oil stove in preference to a gas stove in his kitchen has much faith in his own medicine. He can give testimony with the gas man who believes that if you do it with heat you can do it better with gas and, therefore, prefers a gas toaster to an electric toaster in his dining room. Both may fail to appreciate the point of view of the coal man who, relying on the ancient standard of b. t. u. values, urges the use of coal in the other fellow's cellar but refuses to use it in his own kitchen. The householder attracted by the efforts of the advertiser, may agree that gas has a more desirable "form value" than oil or coal, and that electricity may be more desirable than both, but hesitates to use either for heating his house because of the economic necessity of striking a reasonable balance between the

* W. S. Rockwell Co., New York, N. Y. Presented at the Nat. Meeting Fuels Div., A. S. M. E., Philadelphia, Pa., Oct. 1929.

ideal and the practical.

The average manufacturer is in substantially the same position as the householder. Until such time as we can accept some one form of fuel or electricity for the relatively simple standardized operations in the ordinary household, it is economically unsound, and ethically questionable, to foster propaganda calculated to convey the impression that any one form of fuel or electricity has a monopoly on economic efficiency in the far more complicated heating operations in the industrial heating field.

The point is illustrated, further, by reference to a modern long haul train which may be considered as in illustration of modern practice in the economic utilization of energy resources. Such a train may be drawn from the station by an electric locomotive, with the heat, light and power for its operation generated at a distant point. Later, a coal fired locomotive may be substituted, and the light, heat and power generated entirely from within a self contained transportation unit. In the kitchen of the diner charcoal may be the source of heat for cooking food that may compare favorably in quality with that cooked on an electric, gas, oil or coal range. The coaches may be lighted with Mazda lamps, yet, on the rear of the train and in the hands of the brakeman, kerosene lanterns may be used. It is idle to state that such lanterns have not a place on economic grounds regardless of how they may be considered, in the abstract, as a source of illumination in comparison with a Mazda lamp, without regard to conditions under which the illumination is to be maintained; or to assume that the use of charcoal is inefficient in a dining car merely because it would not be considered in the ordinary kitchen.

Each Fuel Has Its Industrial Place

Each form of fuel or electricity or heating appliance has its place in the wide industrial heating field, under the present economic scheme of things, just as each has its place in the field of domestic heating, illumination, power and transportation.

Progress has been materially retarded by a too intensive consideration of the so-called "fuel problem" which, after all, is but one phase of the real problem, i. e., the heat treatment of metallurgical, ceramic or chemical products. The result sought should be measured in terms of the quality and overall cost of the ultimate product or service not merely by the price of fuel or relative methods of generating, controlling or utilizing heat.

The real problem from the manufacturers' point of view is that of selection, with due regard to the nature of the heating appliance and its relation to his conditions, in a practical process of compromise between the theoretically ideal and the economically practical.

Solution of the problem will develop in proportion to the manner in which we become "heat minded" and as we discount the alleged relation of different forms of fuel or electricity without sufficient thought of the heating equipment and the suitability of that equipment to given production requirements.

Comparisons Not Always Accurate

Much of the every day comparison is misleading and inaccurate because it represents a process of comparing an efficient furnace of one type with a relatively inefficient furnace of another type, and crediting the difference in operating results to some one form of fuel or electricity. The trade literature is saturated with such statements. A comparison is inaccurate unless made with due regard to furnaces having substantially the same thermal and mechanical characteristics.

Comparisons of gas with other forms of heat energy should be made with due regard to the mechanical nature of the heating equipment and the chemical composition of the gas itself, which may be in the form of natural gas, "city gas", mixed gas, blue water gas, oil gas, hot or cold producer gas, butane gases and others, varying in heat value and chemical composition, which materially affect the design of the furnace and its field of usefulness.

Reconstruction of the "city gas" industry to meet present day conditions offers attractive possibilities. Cheaper gas and improved equipment designed to conserve heat will greatly extend the field of gas. Complete gasification of coal following extraction of by-products, with elimination of coke and oil to maintain obsolete candle power standards, and delivery of the increased yield on a heat unit basis for consumption in better heating equipment is economically sound with regard to conservation of energy resources, and provision for better and cheaper service in the industrial and domestic fields.

Fuel oil is a broad target for the well organized gas and electric industries, when not engaged in the process of confounding each other. This fuel fills an economic gap between the more desirable electricity, or gas, and the cheaper but more objectionable solid fields. It's position is relatively weak from the commercial angle because of the relatively low standard of oil furnace design and the still lower standard of furnace operation; also, because of a mistaken notion of the function of so-called "oil burners" which, as a rule, bear about the same relation to the fuel consumption of a furnace that a faucet on the kitchen sink bears to te amount of the water bill; and, further, because of the lack of organization of the fuel oil industry in the interest of the ultimate consumer by joining in the chorus of ballyhoo or otherwise.

Solid fuels still have their place in the economic order, but, naturally, there is preference for the more fluid forms of energy such as electricity, gas, oil, in the order named. The matter of suitability of furnace design and relative prices of the different fuels, is the deciding factor.

Electricity, with suitable heating equipment, has certain advantages over any form of

(*Please turn to page 420*)

Wire Bars from Secondary Copper

Methods Followed in Recovery and Use of Waste Products—Keeping Impurities Down

By W. A. Scheuch and J. Walter Scott
Metallurgical Engineers, Hawthorne Works, Western Electric Co.

UNLESS electrically refined, secondary copper is ordinarily reclaimed as ingots for copper-rich alloy castings. As part of the general policy of reusing its own scrap wherever possible, the Western Electric Co. at its Hawthorne Works is recovering secondary copper as wire bars that are delivered to its own rod and wire mill and there, processed into wire of high electrical conductivity. Naturally, this requires elimination of impurities to a high degree. This departure has been accomplished through careful classification and sorting of materials entering furnace charges and equally careful control of melting and refining. Tests during 4 years have shown that the quality of wire is equal to that from wire bars purchased from electrolytic refineries.

Only clean secondary copper of trade grades 1 and 2 are melted for wire-bar manufacture. This material supplemented by that from various manufacturing processes within the Western Electric Co., consists primarily of copper wire purchased as obsolete equipment from telephone companies. Specifically, the secondary copper consists almost entirely of:

Old Line Wire

1. This classification covers telephone and telegraph wires torn down in the field and purchased by the Western Electric Co. It is usually obtained as well-formed coils varying in weight from a few pounds to 600 lb., although in some cases, because of storms in the field, the wire may be tangled and hard to handle. The fact that this material is sometimes shipped in cars also containing lead-covered cable means that care must be taken to keep out lead as an impurity. The wire is usually coated with weathering products, a particular one of which occurs on wire coming from localities near the oceans, and probably consists largely of copper chloride. When heated, this coated wire fumes badly and causes discomfort to the operators unless they wear respirators.

In this abstract of paper delivered before A. I. M. & M. E. annual meeting, the usual plant and furnace details have been eliminated to give full space for operating and metal facts. Any readers desiring the former can have them by addressing the Editor

Rod-mill Scrap

2. This consists of ends and rejected copper rods from the hot rod-rolling mill. Material is either cut into short lengths, heavy slabs, or wound into bundles weighing approximately 100 lb. each. The copper is coated with oxide and contains some grease.

Wire-mill Scrap

3. This consists of copper wire scrap from the wire-drawing process. In general the wire is made into bundles or bales weighing approximately 100 lb. each. A small amount of scrap is delivered to the furnace as loose wire or in coils from 6 to 18 in. dia., weighing only a few pounds.

Copper Oxide Scale

4. This is the scale that flakes off the copper bar and rod during the hot rolling process. It contains approximately 5 per cent. moisture and approximately 85 per cent copper (dry basis). The impurities are tramp iron and grease from the rolls.

Typical Furnace Charge

A typical furnace, charge consists of material mixed in the following approximate quantities: line wire, 50,000 lb.; rod-mill scrap, 10,000 lb.; wire-mill scrap, 25,000 lb.; copper oxide scale, 5000 lb. It is not necessary to use these proportions or even to mix the materials; a charge consisting entirely of any one kind of scrap other than the scale will produce satisfactory wire bars.

The refinery layout is such that furnace and auxiliary casting equipment are housed in a building 50 by 70 ft. The furnace occupies a space approximately 15 by 25 ft. at one end of the building while the casting area extends from the front of the furnace to the other end of the building. There are eight horizontal mold positions for casting, four end to end on each of the two cooling-water tanks. Experience has shown that it would be better to have 10 mold positions, 5 on each cooling tank. Tanks are spaced 10 ft. to give working area between. There is a clearance of 10 ft. between furnace and first mold position to establish an easy radius on which to swing the trolley supporting the pouring ladle. The storage yard has 6,000 sq. ft. devoted to copper storage, accommodating a reserve of 1,500,000 lb. of scrap copper wire. Loading and reloading of scrap are kept at a minimum by leaving this on the skids on which it comes to the refinery. Runways accommodate in this way more

than 3 days' supply. Near railroad siding where wire bars may be conveniently loaded into cars and switched to rod mill, storage space for 200,000 lb. is available.

Furnace construction follows generally copper-refining reverbratory practice. It has inside hearth dimensions 13 ft. by 7 ft. 3 in. tapering to 4 ft. 6 in. at front, and providing for a metal depth of 2 ft. at front decreasing to 1 ft. 3 in. at back, an average of 1 ft. 9 in. This allows a maximum capacity of 90,000 without overloading. Furnace lining life averages 3-4 mos. Failure usually occurs from heavy corrosion of side walls at metal line. Hot packing has been tried, without satisfaction. Complete relining requires 10-14 days. Roof arches are replaced every 6-8 weeks. This can be done in a day but 2 days are lost bringing furnace back to temperature.

Operating Details and Crew

Operations are conducted on a 24-hr. basis divided into 8 hr. charging and partial melting, 2 hr. to complete melting, 2 hr. for refining, skimming and oxidizing, 3 hr. for poling and 4½-6 hr. for casting. Charging crew operates on afternoon shift. Their duties consist of seeing that furnace is properly charged and partially melted. Charging is done entirely by hand; transveyor skids are spotted adjacent to furnace and charging paddle and the pieces of scrap, weighing approximately 100 lb., are manually removed from the transveyor skids and placed on a long I-beam paddle which is suspended on a trolley located directly on the center line of the furnace side door. The loaded paddle is pushed into the furnace and by a slight twist of the paddle the scrap is allowed to fall off.

Skill is required in placing the scrap in the furnace so that it will be melted down quickly enough. In melting scrap it is desirable that the scrap be placed directly in the flame, because in this type of charge there is considerable dead air space between the pieces of copper. These dead air spaces act as insulation and the heat for melting must be largely supplied by direct contact with the flame. It is for this reason that heavy scrap is much more easily melted than light scrap wire; likewise, quicker melting can be obtained by using more than one burner.

The refining crew operates on the night shift. This crew conditions the charge and begins the poling. Shortly after the charge has come afloat it is skimmed while the slag is still viscous enough to be removed easily. A sample of the copper is taken for immediate analysis to guide the subsequent refining operation. The copper oxide scale is thrown into the furnace at this stage and is sprinkled over the surface to facilitate its mixing with the charge. If the scale is thrown in all at once in one place it is difficult to melt, and copper losses will increase because some scale will be skimmed off with the slag. After the scale is added the charge is thoroughly blown with air through a ½-in. iron pipe from a 15-lb. pressure air line.

Oxidation with skimmings as necessary to remove slag and provide a clean metal surface is continued until a sample button taken from the charge shows a distinct brick-red cubical fracture. At this point the charge contains from 0.8 to 1.4 per cent. oxygen (7 to 12 per cent. Cu_2O). If samples taken approximately every two hours show the lead content to be more than 0.005 per cent. the heavier oxidation is approached. If, however, the lead content is low the lighter oxidation is satisfactory. When the lead content has been reduced and a satisfactory oxidizing button sample obtained, the charge is held for at least 1 hr. and then is skimmed clean. The poling operation is immediately begun by the refining crew.

Poling the Charge

The poling operation usually requires approximately 3 hr. and the burning of at least eight green hardwood poles. The poles used are largely maple and birch; they are each approximately 10 in. dia. at the butt, at least 20 ft. long, and weigh approximately 200 lb. Maple is preferred because it burns more slowly than other woods. During poling the usual test buttons are taken to determine when the oxygen has been reduced to from 0.03 to 0.06 per cent. At this oxygen content the copper is considered satisfactory for casting and this oxygen content, as determined by the set surfaces of the wire bars, is maintained during casting by poling through the side door as required. The set surface of a wire bar should be level or slightly convex, never concave.

Casting Bars

From 4½ to 6 hr. is required to cast the heat of wire bars, two operators dipping alternately. The casting crew consists of these two operators, an operator to tend the furnace and to keep a brand in place to hold back the charcoal on top of the metal bath so that the ladles may receive the molten copper from a clean metal surface, another to spray the molds, another to dump the wire bars from the molds into the cooling water after solidification and two others to remove the bars from the cooling tanks— seven in all.

The wire bars average approximately 250 lb. in weight. They have approximately the same cross-section as the A. S. T. M. standard 225-lb. bar; that is, they are 4 in. wide at the top, tapering to 3½ in. wide at the bottom, and are 4 in. high. However, they are 60 in. long instead of the 54 in. as specified by the A. S. T. M. requirements. The length was increased to obtain a heavier bar which could still be rolled by the reductions applied to standard 225-lb. bars. Ladle is equipped with lips on each side to allow pouring at will from either side and to avoid turning a ladle full of molten metal. Charcoal in ladle prevents oxidation during pouring and is held by dams cast into the bowl side of the ladle. A protective coating of 1/16 in. of refractory cement is applied over the entire surface of the ladle and allowed to dry thor-

(*Please turn to page 427*)

Pickling Iron Wire

Considerations of old and new methods—Evaporation—The Charpy process—Dilution—Other factors

*By Engineer Heinrici**

PICKLING, undoubtedly, is one of the most important processes of the wire refining works. Rolled wire, supplied directly from the wire rollers to the pickling station requires a somewhat longer duration of time than that stored for some time. The atmospheric moisture will have penetrated or opened the pores of the oxide skin, covering the stored rolled wire and thus created a possibility for the pickling acid to begin its corroding action. The removal of the oxide skin is principally done mechanically by the hydrogen, collecting under an increase of the pressure underneath the rolling scale.

In the normal way the utilization of the pickling baths is not carried farther than up to 110 grms. of iron per liter of the pickling liquor, otherwise the formation on the wire surface of the iron sulphate crystals will have to be put up with which would show themselves obstructive in the wire drawing process following.

Old Method Calls for More Vats

If the old method of pickling on stands is employed (two stands with 2,500 kgrms. each of the rolled wire for each pickling vat) 8 to 10 correspondingly large vats are put up for a production of about 120,000 kgrms. of pickled wire in an 8-hour shift. Along with the pickling process mention might be made of the plant for the regeneration of the copperas. There are considerable divergences of opinion yet, whether such plants have a right to exist at all and as to their being profitable, but some points speak in their favour. With the presence of such plant the drainage of the waste liquors into rivers near by, will be dispensed with thus saving many troubles and even lawsuits with neighbours who in case of high water and flooding of plots of land might claim damages. By not utilizing the neutralized pickling liquor, 110 grms. of iron for every liter and a certain percentage of acid will get lost.

Since most of the users of copperas demand large and pure crystals, the sulphate solution will have to contain 140 grms. of iron at least.

Controlling Proper Concentration of Liquor

In order to arrive at the proper concentration the neutralized pickling liquor is evaporated down to 40 degrees Bé. whereby a strength of 160 grms. of iron per liter and a yield of 55 per cent (by weight) of copperas will then be reached.

Admitted, that the evaporating down of the pickling liquor is by no means a cheap iron and that the working plant involves all sorts of expense, yet some profit will result in any case.

In connection with this question we might consider once more Charpy's pickling method, as mentioned several times in this journal. With this process the evaporating of the pickling liquor is done away with, though the green vitriol is regenerated. The pickling baths will have to be utilized well, to arrive at the corresponding contents of iron.

For this purpose the pickling is best carried out in two operations, in a preliminary and in a finishing bath, the latter being used for finish pickling only until a still tolerable amount of iron, about 130 grms. per liter, will be gained. Two copperas crystals, formed on the wire, are removed by dipping it twice, one minute each time, into hot water with a cleansing with water under pressure to follow.

Using Pickling Bath for Preliminary Cleaning

The pickling bath, used so far for finishing, is employed for preliminary pickling only and may be utilized up to a content of 165 to 170 grms. of iron per liter yielding about 60 per cent (by weight) of copperas then.

In the preliminary bath the rolling scale is very nearly cleared away so that the iron freed will be exposed to the acid action in the finishing bath. To avoid pickling losses and to prevent any corroding brittleness of the wire, corresponding quantities of the so-called economical pickling substance are added to the finishing bath. Here we might mention the economical pickling substance "Adaci" as being generally used.

The pickling baths are first charged with mother pickling liquor of about 24 degrees Bé., containing in average 1% of acid and 25 to 30 grms. of iron per liter. Water is added proportionately to the decrease of the mother pickling liquor, caused through the crystalizing out of the copperas. Some preference might be given to the finishing baths, that is to say they ought to have as much water as possible, where the preliminary baths might get less water or mother pickling liquor exclusively.

Dilution and Acidity Control

The pickling baths having been diluted with the right quantity of water and acidified, will show about 26 degrees Bé. In heating the baths now by direct steam condensed water will appear and cause a certain dilution.

In case the Charpy method of pickling is used it is expedient

*In *Draht-Welt Export-Ansgabe*, Halle, Germany.

to pickle in a hanging way, that is to say the wire rolls to be pickled on two pieces of round timber hanging side by side by means of a joint suspension device. The quantity of wire for each vat and charge will be about 2340 kgrms. and for an output of 120,000 kgrms. pickled wire in an eight hours shift 10 to 12 pickling vats of the corresponding size will have to be put up.

To check the consumption of acid, measuring tanks are provided near the pickling vats and that, in elevated position. The acid runs from the elevated main tank to the measuring tank to be measured and from there to the pickling vats.

Electromagnetic Method of Testing Wires Ropes in Service

Description of apparatus and its uses—Installed in colliery—A. C. frequency and flux density

By A. C. Blackall, London

ONE of the difficulties encountered in the economical use of winding ropes arises from the fact that in most cases wire breakages are internal, so that a rope may be seriously weakened without any indication of its dangerous condition. In a paper recently issued by the British Institution of Electrical Engineers, Dr. T. F. Wall described an electromagnetic method of testing wire ropes in service, which shows up at once the presence of broken wires. To this end he employs a powerful electromagnet built up of laminated plates and approximating in form to a horseshoe. A tunnel passes through the legs of this magnet, and through this opening the rope is steadily traversed at the rate of about one foot per secend. An autographic record shows the presence of any flaw discovered during this operation. The magnet is excited by an alternating current, and induces a current in search coils mounted on two thin auxiliary legs located in the gap of the main magnet and parallel with the legs. A narrow band of magnetic flux passes up these auxiliary legs and through the interior of the rope.

The search coils on the auxiliary legs are balanced against each other, so that, so long as the length of rope between the two is sound, a null effect is produced on the indicating instrument. When, however, an unsound section of the rope reaches the first of the auxiliary legs, this balance is destroyed and the indicator responds. This indication is repeated as the flaw passes through the hole in the second auxiliary leg. The differential current due to the two auxiliary coils is magnified by valves so as to obtain a current strong enough to work the autographic recorder.

The record thus obtained shows a pair of kinks as each flaw is passed through the apparatus. Exhaustive experimental work had to be undertaken by Dr. Wall before it was possible to construct a practically useful tester. In this preliminary work, special attention was directed to the question as to whether the skin effect of the outer layers of the locked-coil type of rope would have such a shielding effect on the inner wires as to make it impossible to use alternating currents for the magnet. It was found that the screening effect was unimportant, provided that the frequency was kept down to about 30 cycles per second, and provided that the strength of the magnetic field, at its maximum, approached the saturation value.

The flux density should exceed 16,000 lines per square centimeter. This high density was also found to be advisable for other reasons, as with these strong fields it was found that the permeability of the rope was very little affected by mechanical stress. Another point investigated was the effect of some eccentricity of the rope in the tunnel through the magnet legs. In practice such eccentricity could hardly exceed 1-8 inch, and a displacement of this value was proved to be wholly unimportant. In order to provide a crucial test of the apparatus. Latch & Batchelor supplied a rope into which broken wires had purposely been incorporated. The position and importance of these breaks was known only to the makers, but all were successfully located on the autographic record of the tester. A plant has now been installed at the Hatfield Main Colliery, near Doncaster. This has a shaft 2,580 ft. deep, and the winding rope is 2⅛ in. in diameter.

Central Alloy Steel Corp., Massilion, O., has acquired the property, assets and business of the Interstate Iron & Steel Co., Chicago. The combined concerns will have assets of almost $100,000,000. Interstate owns and operates three plants in the Chicago district, manufacturing automobile steels, carbon steel, wire rods, nails and other wire products.

Sleeper & Hartley TRADE MARK

Practical Wire Wo

These Machines Go Into Production at e—R

Continuous Rod Frame

(No. 5—14 or 15 wire)

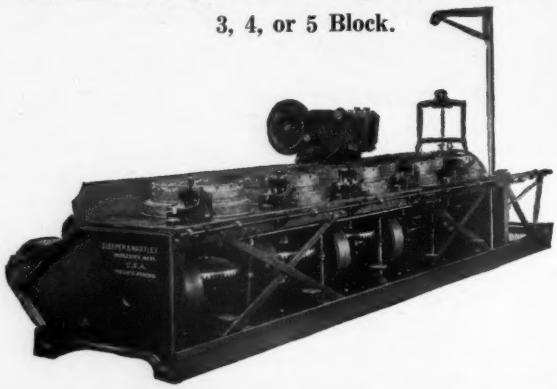
Patented June 3, 1924—May 12, 1925—others pending

All Ball or Roller Bearings

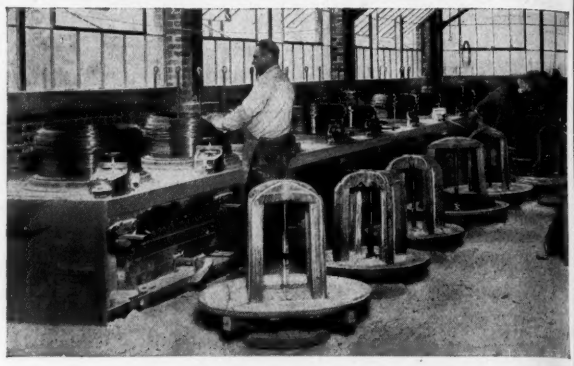
No Differential Gearing.

Automatic Compensation for Speeds of Heads.

3, 4, or 5 Block.



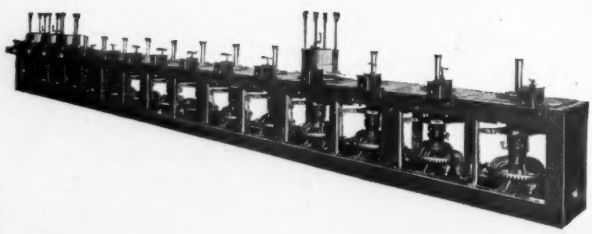
Single Hole Drawing



Standard Rod Frame—10 Block

Long, Stiff Spindles, in anti-friction bearings, and equipped with friction Clutches. Powerful and reliable. Practically noiseless in operation.

(New Plant of Thompson Wire Co., Worcester, Mass.)



Heavy 16" Frame For .65 Carbon Wire No. 10½ to .037"

15 Blocks: Motor driven. Silent chain. Anti friction bearings and cut gears throughout.

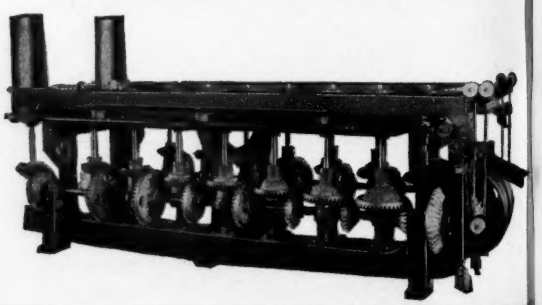
(New Plant of Johnson Steel & Wire Co., Worcester, Mass.)

Double 8-Draft Fine Wire: Wet

No. 22 to 36. High or low carbon wire.

6 Blocks to Average Operator, 22-33, 8-hole, 660 lbs. pe of ten hours.

Many thousands of these heads in operation



CHICAGO TERRITORY
Neff, Kohlbusch & Bissell, Inc.

San Francisco:
L. G. Henes Machine Tool Division of Jenison Machinery Co.

Los Angeles:
L. G. Henes Machinery Co.

FOREIGN AGENTS AND REPRESENTATIVES: UNITED KING DOM—Mr. Fredk. A. Perry, 63 Queen Victoria St., London, E. C. 4.
AUSTRALIA AND NEW ZEALAND—Edwin Wood Pty. Ltd., Melbo urne
MONTREAL AND TORONTO—Arthur Jackson Machine Tool Co.
JAPAN—Andrews & George Co., Tokyo

SLEEPER & H

rking Machinery

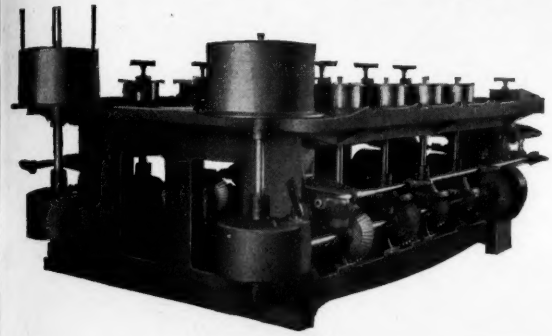
Sleeper & Hartley TRADE MARK

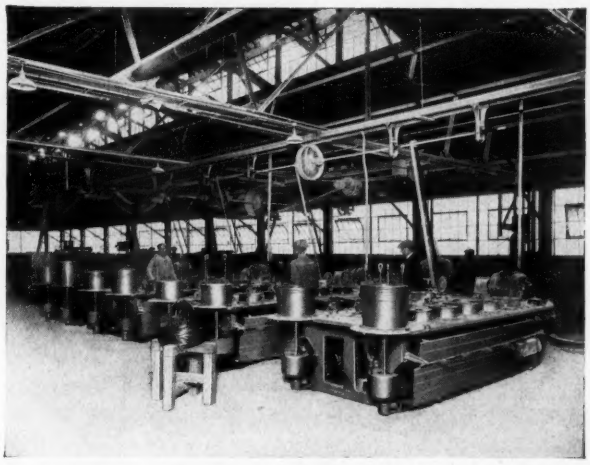
—Reducing Overhead—Increasing Production!!

Double 5-Draft Dry, Intermediate

No. 14 to No. 23. High or low carbon wire.
3 to 4 Blocks to Average Operator.
No. 14 to 19—4 hole, 1400 lbs. per block.
No. 14 to 20—5 hole, 1100 lbs. per block.

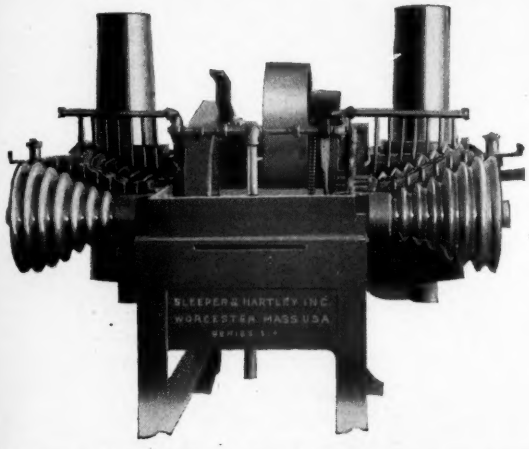
More than 300 heads of this improved model in operation



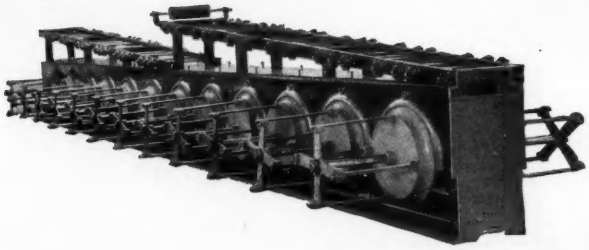


Battery of Double Six-Draft Dry Continuous For High Carbon Wire

Direct driven with silent chain. Cut gears throughout. Anti-friction bearings. Variable speed for finishing block.
(New Plant of Thompson Wire Co., Worcester, Mass.)



Improved Double 8-Draft Cone Type Continuous Wet Wire Drawing Machine



Patenting Furnace Take-Up

(New Plant of Thompson Wire Co., Worcester, Mass.)

NEW YORK TERRITORY—Triplex Machine Tool Co.

Philadelphia Territory
Swind Machinery Co.

RTLEY, Inc., WORCESTER, MASS., U. S. A.

NEWS *of the* INDUSTRY

Foreign Trade Opportunities reported by the U. S. Bureau of Foreign and Domestic Commerce during the month of November include inquiries from the following sources: Wire netting (41613) London, England; plain and barbed wire (41660) Havana, Cuba; black and galvanized wire (41672) Buenos Aires, Argentina; ornamental ironwork fencing (41890) Winnipeg, Canada; barbed and galvanized wire, and wire-clamping equipment (41792) Bogota, Colombia; resistance wires for electric heating appliances (42095) Rio de Janeiro, Brazil; steel rolls and semi-manufactured steel, all sizes (42068) Glasgow, Scotland; wire fencing and poultry netting, and wire kitchen utensils (42094) Mexico City, Mexico; horseshoe nail hot-drawing machines (42116) Warsaw, Poland.

The Algoma District Power Company is to transmit the current over a high tension transmission line 115 miles long, from High Falls on the Michipicoten River. The Government of Madras, Major H. G. Howard, Madras, India, is forming a program of hydro-electric development involving $10,000,000 to $25,000,000.

Aerial Cableway Is Opened To Ascend Harz Mountains

The first aerial cableway in the Harz Mountains, Germany, has been opened, the Dept. of Commerce has announced.

This line connects Bad Harzburg, about 1,000 feet above sea level, with the Burgberg. The entire length of the cableway is about 1,500 feet and the difference in the altitude between the valley and the hill station is 600 feet thus enabling visitors to the city of Bad Harzburg to be transported to a height of roughly 1,600 feet.

The cable has only one intermediate supporting mast, about 65 feet high. The cabins follow recent advance in cabin construction, having 12 corners and affording 19 passengers an unrestricted view in all directions. Safety is assured by safety appliances, such as cable brakes, cabin telephone, wind scale, location indicator, etc. The trip in either direction takes 2½ minutes. It is planned to extend the line later by a larger section to the Molkenhaus, a well-known Winter resort at the foot of the famous Brocken.

Continental Wire Rod Cartel Extended

At a meeting held in Brussels late in September, the Continental wire rod cartel made no changes in prices. The trade in Germany, Belgium, France and Britain expected an advance and to forestall this had placed many orders. This has occasioned some dismay and disorganization. The cartel has been extended to the end of 1930.

Huge Savings in Wire Plant Waste Reclamation

THE reclaimed materials organization at the Western Electric Company's Hawthorne (Chicago) works now handles and sells about $7,000,000 worth of reclaimed waste annually. The metallic sweepings alone are worth $100,000 annually. Switchboard wire is dipped in paraffin and sold to radio manufacturers. The old wooden lags used on cable spools are sold to Chicago bakers, because the blaze from the wood makes an even heat for baking bread.

The insulation around copper wires inside of cables is a very high-grade, fine-textured manila paper. It is removed from junked cables in a specially constructed machine and sold in bales to paper plants. There the paper strips are bleached and remade into insulating paper. Special markets have also been found for a limited amount of this paper for the manufacture of artificial flowers. Incidentally by-products from Hawthorne will provide all the material needed for producing illuminated paper flowers. The insulating paper is used for petals and leaves; telephone wires provide suitable stems; and switchboard lamps produce the illumination.

Wire and Nails Coming from Germany

Practically all the wire nails and barbed wire being imported into the United States now from Europe is coming from Germany. German exports of barbed wire to the United States have exceeded 450 tons and wire nails 600 tons, monthly so far this year. Most of this is being shipped to Gulf and Pacific ports.

Screws Lower Because of Foreign Competition

Partly because the German makers of wood screws have not renewed the agreement with British manufacturers concerning mutual market protection, and partly because of keener Belgian and Swedish competition wood screws are much lower in price in the British market, in Canada and other parts of the Empire and are continuing to go down. Many thousand gross of German wood screws have been sold in Canada and a great many additional inquiries have resulted.

German Cable Makers May Build in U. S.

The recently-formed cooperative export corporation, established in Berlin, by 10 German cable manufacturers will handle principally sales of cable in foreign markets, but plans to establish plants in countries with too high a duty. Plans are being considered for a cable-manufacturing plant in the United

States. Exports from Germany have averaged 5,000 tons a month.

Personal Mention

Cornelius F. Kelly, president, Anaconda Copper Co., has been awarded the gold medal of the A. I. M. & M. E., for conspicuous services in the metallurgical industry.

R. L. Agassiz, chairman of the board, Calumet & Hecla Consolidated Copper Co., was re-elected president, Copper & Brass Research Assn. at the recent annual meeting.

Obituary Notices

Frank Tenney, secretary, Pennsylvania Steel Co. for 15 years before its merger with Bethlehem Steel Co. in 1916, died of heart disease on the golf course of the Merion Cricket Club, early in October. Mr. Tenney, who was 67, has been active in steel work all his life but retired after the Bethlehem merger.

Ernest F. Harder, assistant to the vice president of the Westinghouse Elec. & Mfg. Co., died October 13, at his home in East Orange, N. J. He was in his 72nd year. Mr. Harder was one of the first employees of the late George Westinghouse in his work on alternating current. He was with the company for 41 years. In 1893 he transferred to the Newark works, and in 1904 became superintendent. In 1918 he was promoted to works manager and in 1926 became assistant to the vice president.

Wallace Sherman Clark, electrical pioneer and general consultant in the General Elec. Company's cable section, died at Schenectady, N. Y., Oct. 12. After graduation from Sheffield Scientific School in 1885, Mr. Clark entered the commercial and engineering work, and was associated with electrical cables throughout his life.

COMING EVENTS

December 6. Ontario Chapter of the American Society for Steel Treating, Toronto, Ontario.

December 2-6—Annual meeting of the American Society of Mechanical Engineers at the Engineering Societies Building, 29 W. 39th St., New York City. Calvin W. Rice, secretary, 29 W. 39th St., New York City.

December 2-7. National Exposition of Power and Mechanical Engineering at New York. Address Charles F. Roth, 420 Lexington Ave., New York City.

December 18. International Assn. Municipal Electricians at Boston. Secretary, H. N. Lang, City Hall, Orlando, Fla.

January 10, 1930. Ontario Chapter of the American Society for Steel Treating, Hamilton, Ontario.

February 7. Ontario Chapter of the American Society for Steel Treating, Toronto, Ontario.

February 14-15 — Semi-annual meeting of the American Society for Steel Treating at New York, N. Y.

May 29-31—57th Annual Meeting of the American Electrochemical Society at St. Louis, Mo.

Parker Douglas Handy, president, Handy & Harmon, dealers in bullion and specie, with plants in New York, Bridgeport, Conn., and Providence, R. I., died at his New York residence on Nov. 13, aged 71, after a brief illness. He had been president of the company from its beginning to 2 years ago when he was elected chairman of the board. He was a director of the Farmers' Loan & Trust Co., New York and a life trustee of Princeton University.

Charles S. LePoer Trench, editor of The American Metal Market and senior partner, Charles S. Trench & Co., died in New York on Nov. 9, aged 75. A native of Stradbroke, England, he came to New York as a young man and entered the metal business in which he spent his entire life. In 1881 he established his own firm and for the past 40 years has been an important figure in the metal trades.

New England Wire Co., Westfield, Mass., has been purchased by the Noma Electric Co. and the Pilot Radio & Tube Co., jointly. At regular capacity, the New England company turns out 200,000,000 ft. of wire a year, employing 400. Noma and affiliated concerns use approximately 100,000,000 ft. a year and bought the New England firm to provide for present needs and expansion. Recently, Noma purchased the Everett Mills plant in Lawrence, Mass., to which it is expected the New England equipment will shortly be transferred. Detroit Radio Products Co. and Tinsel Corp., of America, affiliated concerns, have recently moved into the Everett plant.

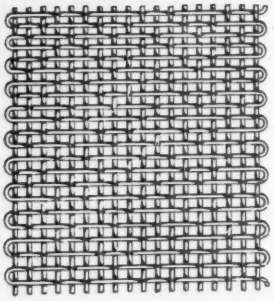
Anaconda Wire & Cable Co., subsidiary of the American Brass Co., has been formed with mills in seven states, from Rhode Island to Montana, to handle exclusively the manufacture of electrical wires and cables from fine magnet wire to the super-voltage transmission cables.

Etablissements Joseph Vianney (Vianney Wire Die Works of New York) have purchased the diamond die plant of Ernest Vianney at Le Creusot (France). This is now being enlarged to supply further American demand for high grade dies. Other plants are located at Trevoux and Vezeronce (France). The Trevoux plant is the largest in the world today.

The National Harris Wire Co., Newark, N. J., has installed additional machinery for the production of seamless nickel tubing for use as cathodes in A-C heater type radio tubes. This tube offers many advantages and is rapidly replacing the seamed tube. Seamless tubing is used in several sizes, the smallest measuring 1-16 in. in diameter with a wall .0015 thick. This very thin wall added many difficulties to the tube-drawing technique and new methods and machinery had to be devised to produce a perfect product.

The company is now in a position to meet the increasing demand for this product and give prompt delivery.

A REVIEW *of* RECENT PATENTS



No. 1,733,116, FABRIC, Patented October 29, 1929 by Charles A. Coups of Belleville, New Jersey, assignor to Eastwood Wire Manufacturing Company of Belleville, New Jersey, a Corporation of New Jersey. In wire cloth provides a modified twill weave in which the ridges formed by the bends of the warp wires in passing over the weft wires extend in a zig-zag line laterally of the fabric and thus counteract the above noted tendency of the pulp to work out to the edges of a band made for use in paper making, the inventor of such fabric.

No. 1,729,955, APPARATUS FOR UNWINDING COILED WIRE, BAND IRON AND THE LIKE. Patented October 1, 1929 by Curt Matthaei of Offenbach-On-The-Main, Germany. This device is adapted for use with moulding press, machine tool or the like and is intended to expedite and facilitate the unwinding of wire, etc.

No. 1,730,740, ELECTRIC CABLE. Patented October 8, 1929 by James J. Morrison of Worcester, Massachusetts, assignor to The American Steel and Wire Company of New Jersey, a Corporation of New Jersey. The object of the patentee's invention is to provide a construction of wire cable which will be more evenly and uniformly saturated when manufactured, and which will maintain such saturation more uniformly after installation when the cable is connected with such oil supply reservoirs.

No. 1,730,741, WIRE ROPE. Patented October 8, 1929 by Walter F. Munford of Worcester, Massachusetts, assignor to The American Steel and Wire Company of New Jersey, a Corporation of New Jersey. This invention relates to improvements in steel or ferrous metal wire strands and cables, and has for its object the provision of articles of this class in which the surface of each of the individual wires of the article are lubricated by being impregnated with a dry lubricant such as graphite during their drawing operations whereby corrosion is resisted and internal stresses and wear reduced.

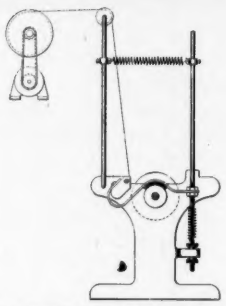
Complete descriptions and drawings of any of the patents referred to on this page may be had for twenty five cents. Address orders to Wire & Wire Products, 551 Fifth Avenue, New York City.

No. 1,730,980, WIRE-STRIPPING TOOL. Patented October 8, 1929 by Robert J. Montgomery of Chicago, Ill. The principle objects of this invention are to provide a wire stripping tool construction which will avoid side play between the pivoted members carrying the clamping and stripping jaws and between the jaw carrying members and the handle levers, to increase the capacity of the tool, to reduce the spread of the handle levers, to make feasible the use of stampings in lieu of forged parts.

No. 1,731,426, THREAD OR WIRE DRIVING MEANS FOR CORE-COVERING MACHINES AND THE LIKE. Patented October 15, 1929 by Gaston Charles Leon Gineste Lachaze of Caluire, France. According to this invention, the angular speed of the reel on which the wire is wound, in connection with covering machines, is automatically varied and a constant linear speed of the thread or wire is obtained by driving the reel by means of a belt or the like which acts on the periphery of the cylinder formed by the covered thread or wire already wound on the reel.

No. 1,731,843, APPARATUS FOR CLEANING WIRE. Patented October 15, 1929 by Antonius de Graaff of Eindhoven, Netherlands, assignor by mesne assignments to General Electric Company, of Schenectady, New York, a corporation of New York. This invention relates especially to the cleaning off of the adhering coat of lubricant from the wire used as filaments in incandescent electric lamps. According to the invention, the layer of lubricant is also first loosened by passing the wire through a boiling bath containing a solution of sodium phosphate, potash or caustic soda or mixtures of these solutions. According to the invention the wire is then passed through a scouring device preferably between two or more scouring rolls, turning on axes which make an acute angle with the direction of the wire.

No. ,733.994. WIRE GRIPPER. Patented October 29, 1929 by Peter Lalanne and Harry Armstrong of Seattle, Washington, assignor to William C. Brandt of Seattle, Washington. These inventors have designed a wire gripping device for use in wire tieing machines, to make possible the use of long lengths of wire, as from a roll or reel, by cutting off the length of wire each time a tie is made, instead of using short lengths of wire already cut.



No. 1,733,834, TENSIONING DEVICE. Patented October 29, 1929 by Russell Steele of Fort Wayne, Indiana, assignor to General Electric Company, a corporation of New York. This device is intended for wire coil winding machines, and the invention relates particularly to a flexible brake arm which bends during the application and release of the brake so as to cause the braking force to be changed gradually.

No. 1,732,072, DEVICE FOR APPLYING AND TWISTING WIRE. Patented October 15, 1929 by Earl D. Tubbs of New York, N. Y. This invention relates to devices for applying wire to boxes, bundles, bales or the like and contemplates a mechanism of co-operating parts adapted to first tighten the wire encircling or encompassing the box, or the like; second, to twist the overlapping portions thereof and finally to clip off free ends adjacent the twisted wire.

No. 1,732,615, PROCESS FOR IMPROVING THE STRENGTH QUALITIES OF STEEL WIRE. Patented October 22, 1929 by Wilhelm Pungel of Dortmund, Germany, assignor to the firm Vereinigte Stahlwerke Akiengesellschaft of Dusseldorf, Germany. In order that the capacity for expansion of steel wire increases considerably while its tensile qualities undergo comparatively little change, the inventor subjects the wire, after the last cold drawing to a tempering temperature of at least 350°C. but not higher than the Acid point.

No. 1,732, 640, WIRE ROPE AND PROCESS OF MAKING SAME. Patented October 22, 1929 by Edward A. Conner, of Stratford, Connecticut assignor by mesne assignments to American Cable Company, Inc., a corporation of Delaware. This inventor provides in the process of making stranded wire rope, the steps which comprise forming expansible strands each having a plurality of wires, and subjecting the several strands to the action of devices adapted to form them into helices, and laying them in position to form component parts of a wire rope having an inert lay conformation.

German Tests of Acids During Picking

(*Continued from page 406*)

acid baths is arsenic. Acids rapidly lose their strength in the presence of arsenic and the steel is covered with an arsenical deposit. The tolerance on arsenic is 0.01 per cent in 66 deg. Be H_2SO_4 and 0.005 per cent in 22 deg. Be HCl. A qualitative test can be made by diluting to 45 and 20 deg. Be. respectively and adding a few cubic centimeters of a 30 per cent KI solution. The formation of a yellow colloidal precipitate indicates only traces of arsenic. A yellow flocculent precipitate indicates larger quantities and the sample should be analyzed.

Of greater importance in operation of pickling baths are periodical data on the temperature and acid strength. While thermometers serve adequately for temperature measurement, the determination of free acid in the presence of iron salts presents certain chemical difficulties.

A method now in use in Germany consists, in principle, of allowing a definite amount of the acid sample to react in a closed vessel with a weighed amount of potassium carbonate. The volume of CO_2 thus liberated is read off on a burette calibrated directly in per cent of free acid.

The taking of tests at 2-hr. intervals is recommended. It is also pointed out that the analysis of the waste liquor in this same way will frequently disclose the wastage of considerable amounts of useful acid.

The Iron Age, Nov. 7, 1929

Galvanic Zinc Coating of Wire

(*Continued from page 407*)

diameter, the properties of the wire substance, and the thickness of the zinc coating desired. Generally speaking, it varies between 5 and 15 m. per minute. A coat of from 50 to 70 g. zinc per 1 qm. wire-surface has adequate rust-resisting properties.

The following bath is recommended for the zincing of wire: 100 liters water; 32 kg. zinc-sulphate; 9 kg. ammonia sulphate;; 3.5 kg. boric acid.

Addition Agents Improve the Coating

The most appropriate temperature for such a zincing bath fluctuates between 45 and 50 deg. C. The precipitation is extremely soft at this temperature and adheres firmly to the wire. Certain admixtures produce excellent precipitations. The addition of from 80 to 120 gr. of grape-sugar, gelatine, albumin, or gum arabic to each 100 liter of zincing solution is recommended. An admixture of mercury does not give satisfactory results, because its precipitation has a tendency to become brittle and coarse-grained. Zinc coating should have enough resistance to withstand the strain of further drawing, pressing, and bending. Hence, the bath should be of moderate acidity and medium electrolyte concentration, because an excess of either produces hard blistered precipitations.

The monthly production of an outfit designed to take care of from 50-60 wires of 1.5-4 mm. dia. with zinc coatings of 65 g. per m^2 is about 700 tons. Wire galvanization involves a complicated working technique and requires good schooling and extensive practice. Years of experience and experiment are needed to build a plant of definite annual production capacity.

The Inca Mfg. Corp., Fort Wayne, Ind., which recently purchased an 11 acre factory site has completed the first building unit, 200x300. This will be used to manufacture copper wire products and specialties essential in radio, automotive and electrical industries, specializing in magnet wire and windings for electrical purposes. George A. Jacobs, is president, W. C. Glass, vice-president, and George W. Spindler, secretary-treasurer.

Williamsport Wire Rope Co., Williamsport, Pa., is erecting a one-story factory building 100x 180 near Sparrows Point, adjacent to Baltimore, Md.

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The Life Of The

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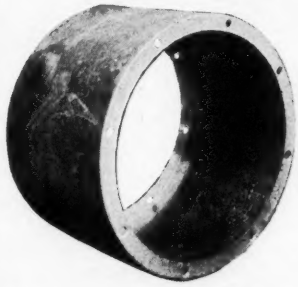

THE OUTSTANDING

DEVELOPMENT

FOR

IMPROVED

SHIPPING REELS

WRITE FOR
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Manufacturers of

"RED HEAD"
SHIPPING REELS MACHINE

for the Wire & Cable Industry

Economics of Industrial Heating

(*Continued from page 409*)

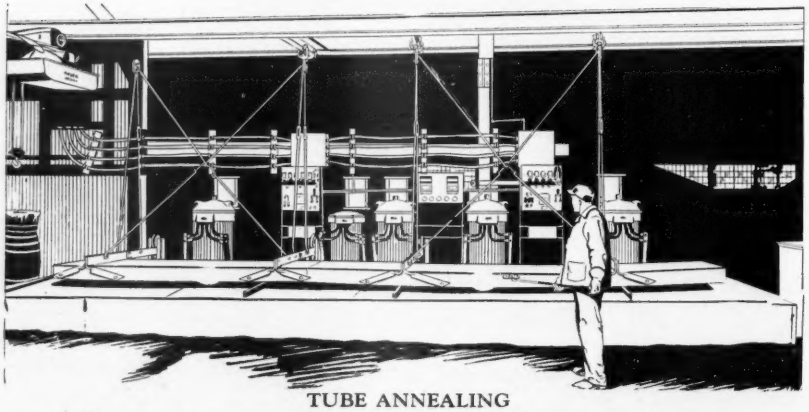
fuel in the industrial heating field, as in domestic heating, illumination or power. It would be a most extraordinary development that would permit gas, oil or coal to duplicate the results produced daily by the induction furnace for melting brass; the high frequency furnace for melting steel; the advantages of electric welding; and many others, including the electric toaster, the electric iron and the electric range. The results made possible with such appliances, and the difficulty of producing equally favorable results with any form of fuel equipment, is another illustration of the economic folly of the "technical sectarianism" that seeks to rest its case on the alleged technology of comparative fuel values, instead of upon the economics of the heating operation as a whole. The necessity for a broader viewpoint, and the weakness of much of the present-day practice, is sustained by the results of present-day electrical development.

Progress in Electric Heating

Progress in electric heating practice has done more to break down traditions of the past, to disprove the economic absurdity of much of our fuel technology, and to develop a more wholesome economic perspective than anything in the history of the industrial heating art. The development will continue at a still more rapid rate because of the natural desire for convenience, comfort, accuracy of control, safety, etc., at reasonable

Bellis Lavite

the ideal heating medium



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Complete descriptive material of Lavite and Electric Furnaces is yours on request.

WIRE ANNEALING

You will be surprised at the results produced on your samples with Lavite Annealing.

cost, which exist just as much in the shop as in the home.

The relative economic position of the different forms of fuel and electricity will continually vary with the development of new forms of heating equipment suited to shop conditions along lines followed in the household with improved types of ranges, cooking utensils, and other heating appliances. There will be, undoubtedly, a certain amount of overlapping of effort and waste due to the difficulty of effecting a reasonable compromise between the nature of the result and the price that the consumer can afford to pay for that result.

Development of improved forms of electric equipment, will automatically, lead to development of improved forms of fuel equipment with which the question of suitability, cost of operation and economic status of the purchaser will be a controlling factor. However, the outstanding "form value" of electricity, and the obvious indirect advantages of electric equipment, aside from the matter of cost, will tend toward development of many heating operations which it will be difficult, if not impossible, to duplicate with any form of fuel because of the intangible values that cannot be clearly expressed in economic terms of money, or technical terms of thermodynamics.

Intangible advantages of electric heating equipment of unquestioned, though indefinite, economic value, should be recognized by the manufacturer who ultimately pays the bill, and by the advocates of different forms of fuel attempting to consider the problem from his point of view. Among these may be included absence of heat and odor from spent gases; elimination of products of combustion; simplicity of temperature control; control of atmosphere; decreased dependence upon the "human element"; possibility of maintaining local heating zones without materially affecting any other section of the furnace; locating the furnace in line of production or in a position to which

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Vianney Wire Die Works wish the readers of Wire & Wire Products a Merry Christmas and a Happy and Prosperous New Year.

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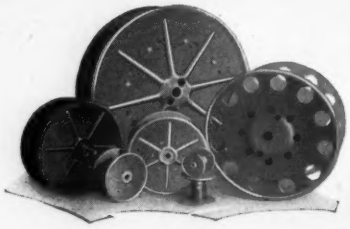

You Can't Go Wrong by Saving Money

The many firms in the wire industry which have standardized on Apco Mossberg equipment have done so for just one reason: to save money.

You can't go wrong saving money, in wire handling, manufacture, or shipping; and Apco Mossberg pressed steel reels and spools will save it for you.

They are light in weight, extremely true and long wearing.

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Specialists for twenty years in the development and manufacture of steel reels for annealing, vulcanizing and stranding; also bobbins for wire weaving.

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SCALE-REMOVING acid can do a much more thorough job, when it has *clean* wire upon which to work. Wire cleaned the Oakite way is free from the dirt, grease and oil that hamper acid action. For this reason, a better grade of wire is obtainable, and at the same time acid consumption is less.

Our nearest Service Man will gladly explain how and why Oakite materials and methods will help you to turn out better wire . . . faster, and at less cost. A postal or 'phone call to us will bring him to your mill. No obligation, of course.

Oakite Service Men, cleaning specialists, are located in all the leading industrial centers of the United States and Canada

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Industrial Cleaning Materials and Methods

it may be inconvenient, or inadvisable, to run pipe lines; automatic starting or stopping from a time clock; automatic operation at night without an attendant; maintenance of a given atmosphere of gas such as hydrogen, without muffles; relatively high "heat balance" of the furnace; influence upon the electric load and rate for the plant as a whole particularly by operation at night; and in general, all those intangible indirect advantages of electric equipment that may influence the quality of overall cost of the ultimate product, or working conditions for the men.

Certain Electric Equipment Advantageous

As with the electric motor, certain forms of electric heating equipment, because of such advantages, have been found to establish new standards of production and to attract a better type of operative essential to the development of better heat treating practice.

When electric equipment can produce a result in a manner that is difficult to duplicate with fuel, as with the induction or high frequency furnace, or electric toaster, it is then obvious that there is a difference in economic value that cannot be definitely measured in terms of fuel cost. On the other hand, when fuel equipment can be developed to produce, substantially, a result approaching or equivalent to that of electric equipment, then the matter of cost for installation and operation, and the economic status of the purchaser, becomes a deciding factor. An attempt to seek a solution for such conditions by an abstract comparison of the price and alleged heating values of different forms of fuel or electricity, is the logical equivalent of a debate on the relative merits of wine or water as a beverage without regard to the conditions or the occasion, for which either, or both, may be suitable or acceptable.

The technique of industrial heating practice is much more complicated than is generally sensed, as most of those at-

tracted to it have been forced to realize. One difficulty is that the economic value of the results sought cannot be measured in definite terms as in illumination, power, or transportation. Different standards of quality that cannot be expressed in terms of heat, or thermodynamics are held by the metallurgist, the engineer, the ceramist and the chemist.

Another difficulty is that of attempting to take an economic view of the problem from the standpoint of the manufacturer on the assumption that he is entitled to consideration of both sides of the coin. Usually, he becomes confused by intensive technical discussion of different forms of fuel or electricity, with the result that the furnace engineer attempting to adopt his viewpoint is caught between the devil and the deep sea of competing fuel advocates, and usually he is damned by all hands likely to lose sight of the result actually sought and the many factors affecting the decision.

Standardization Very Difficult

The unending variety of manufacturing processes and plant conditions make it difficult to standardize industrial heating equipment to the extent common with machine tools and the like. The result is a continual process of unending engineering development similar to that of the early days of the automobile when, rarely, two cars were produced alike. The situation is complicated enough when but one form of fuel or electricity is dealt with, but it is still more difficult if one attempts to adopt an unprejudiced and openminded economic attitude on the problem as a whole, in the belief that he should consider the interests of the manufacturer as the architect would consider the interests of the man about to a house. The ensuing amount build a house. The ensuing amount of free engineering service and the consequent high overhead incident to unreasonable, and frequently unethical demands of the purchaser, re-

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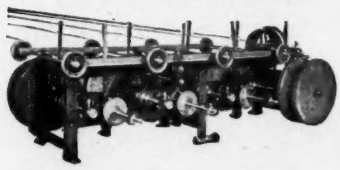

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The cut on the left shows a few of the thousands of the forms made on this
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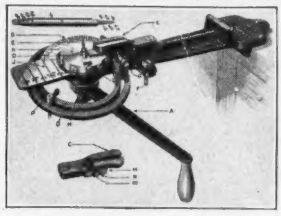

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Cleveland, Ohio, U. S. A.
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HAS BEEN THROUGH THE FURNACE
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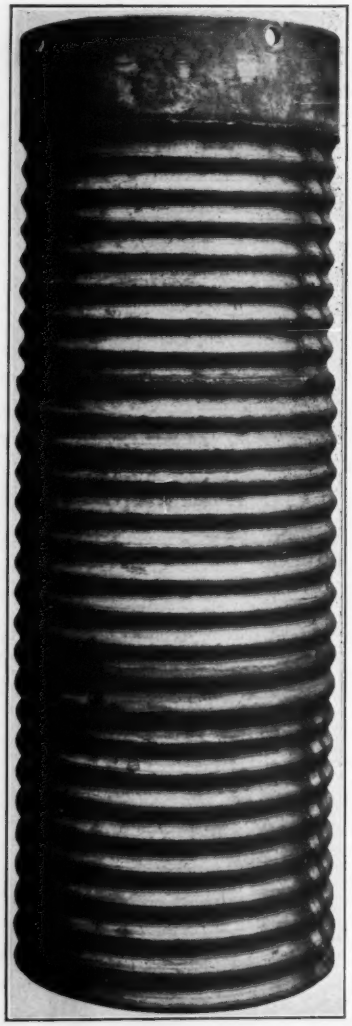

The entire outer surface is highly resistant alloy steel ⅛ inch thick and corrugated. Light in weight, quicker heating and cooling properties and non-scaling outer surface.

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sults in an unsound condition that is not sensed as it should be by the fuel or electric interests, which should encourage development of equipment in which their respective commodities are used.

The present unfavorable situation will improve as we become more "heat minded"; as we grow to consider the problem from the point of view of the manufacturer who is most concerned with better methods of heating and cooling to improve quality; better methods of handling and better working conditions for the operative to reduce cost, and the selection of such form of fuel or electric equipment that is best adapted to his requirements—all things considered.

As this viewpoint is accepted the field of industrial heating, one of our oldest and most important industrial arts, will assume enlarged proportions and have the recognition justified by its technical and economic importance. Under such conditions each form of fuel and electricity and heating equipment will have its proper place, with due regard to the economics of each individual case as in the field of power, illumination, transportation and domestic heating.

Important Change of Name

Dimondite wire dies will be called Firthaloy in the future, according to the makers of this tungsten carbide material, the Firth-Sterling Steel Co., McKeesport, Pa., and the Master Wire Die Corp., New York. In addition, the material for cutting tools will be changed from Dimondite to Firthite. The name changes were caused by prior use for similar products although this use by another firm was not registered at the Patent Office, as Dimondite was. It will avoid much confusion in the trade.

Advantages claimed for the new Master-Firthaloy dies are extraordinary lasting qualities, a new shape that eliminates shouldering and by facilitating lubrication prolongs life, and

The Waterbury Wire Die Co.

Diamond, Composition and CHILLED IRON DIES
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New way for re-inforcing the diamond.
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extreme accuracy. The latter quality was evolved by eliminating entirely the human element, all dies being produced by new specially-built automatic machinery.

Steel Corporation Takes Over Columbia

The U. S. Steel Corp. announces that it has purchased the Columbia Steel Corp., the largest on the Pacific Coast, and will enlarge and expand some parts of the company's production. While insignificant along side of U. S., Columbia is a big factor on the Coast, producing among other things most of the wire rods and billets used there. It was an outright purchase.

Roumanian Firm Has Accumulation of Short Lengths

A manufacturer of wire ropes in Roumania, The Anglin Co., at Ploesti, has a considerable accumulation of short lengths of wire, mainly .052 in. in diameter and would be glad to consider any proposition for the use of this, or the purchase of a machine to work it up into saleable articles, or an outright sale of the wire as is. Any one interested can address the Editor, or Percy R. Clark, managing director, directly.

New Chase Plant for Cleveland

The Chase Brass & Copper Co., Waterbury, Conn., will construct the first of two units of a $6,000,000 mid-Western plant at Euclid, O., adjacent to Cleveland and have this unit, measuring 255x1,000 ft., ready early in the new year. The Austin Co., Cleveland, has the building contract. Brass and copper wire will be produced as well as other brass shapes.

New Wire Plant in Iowa

The Mattson Wire & Mfg. Co., with plants for manufacturing snow and other forms of wire fence at St. Paul, Minn., Joliet,

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Manufacturers of

DIAMOND DIES

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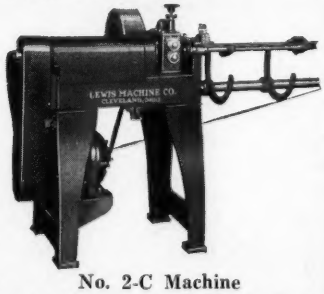
WIRE STRAIGHTENING AND CUTTING MACHINES

Allis-Chalmers Texrope Drive, Timken Roller Bearing Equipped. Built to endure hard service. Sizes up to 5/8 diameter wire.



No. 2-C Machine

LEWIS MACHINE CO., 6305 Central Ave., Cleveland, Ohio

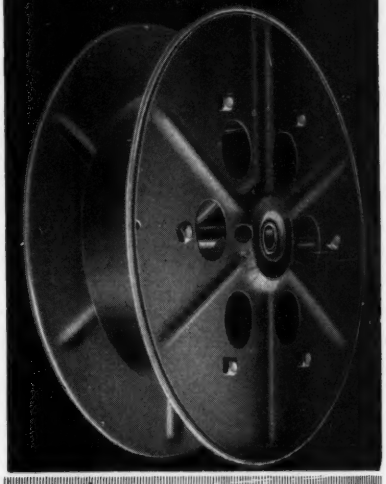
AMERICAN PRESSED STEEL REELS

PRACTICALLY INDESTRUCTIBLE STANDARD TYPES 2½ IN. TO 8 FT. SPECIAL TYPES MADE TO ORDER WRITE FOR CATALOG

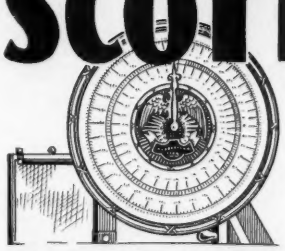
THE AMERICAN PULLEY CO.

PRESSED STEEL: PULLEYS HANGERS HAND TRUCKS MISCELLANEOUS STAMPINGS

4200 Wissahickon Ave., Phila., Pa.



SCOTT



HORIZONTAL & VERTICAL TESTING MACHINES FOR WIRE

Give visible reading and graphic charts showing strength, stretch, elongation and action under stress. Used to establish standards governing purchasing and manufacturing.

HENRY L. SCOTT Co.

PROVIDENCE, R.I.

TESTERS

Professional Directory

Listing in the Professional Directory is recommended to all engineers, engineering and construction firms and consultants seeking business with wire mills or plants utilizing wire in any form.

W. H. SPOWERS, JR.
Consulting Engineer
551 Fifth Ave., N. Y. C.
Specializing in Galvanizing
Plants Designed and Installed
Vanderbilt 7395 Practical Engineering Advice

ANNEALING SALT BATHS
FOR
Steel and Copper Wire
Inquiries Solicited
European Color & Chemical Co., Inc.
WEEHAWKEN, NEW JERSEY

Broden Construction Co.
Wire Mill and Cold Rolling Equipment
10255 Harvard Ave.
CLEVELAND, OHIO

This is a double-sized Professional Card

For the Business it will bring you the price of a professional card in this directory is very low.

WANT TO BUY

Several Wire Drawing Machines with spooling attachment for small wire, 22 to 40 W&M gauge. Must be modern and in good condition. State maker, age, condition and price. Box No. D 1.

PATENTS
TRADE-MARKS
SERVICE

Without charge or obligation, we will inform you on any questions you may put to us touching on patent, trade-mark and copyright law. You may ask: "Should I protect myself by patent or register under the trade-mark or copyright laws? What kind of a patent should I obtain?" and many other questions that may occur to you. These are vital points to consider and questions will be cheerfully answered.

Evidence of Conception

Before disclosing your invention to anyone send for blank form "EVIDENCE OF CONCEPTION" to be signed and witnessed. As registered patent attorneys we represent hundreds of inventors all over the United States and Canada in the advancement of inventions. The form "Evidence of Conception," sample, instructions relating to obtaining of patents and schedule of fees sent upon request.

LANCASTER & ALLWINE
Registered Patent Attorneys
473 OURAY BUILDING
WASHINGTON, D. C.
Originators of forms, "Evidence of Conception."

Ill., and Williamsport, Pa., will erect a new factory on West Butler St., Manchester, Iowa. Contracts now in hand for highway fencing call for delivery of 200 carloads.

Republic Brass Changes Name to Revere

The Republic Brass Corp., controlling six well-known firms and operating 25% of the country's copper, brass and bronze rolling mill facilities, has changed its name to Revere Brass & Copper, Inc. It is said that Paul Revere of historical frame, was the first American to roll copper and one of the first in the world. The successor to his firm of Revere & Son was one of the units to make up the Republic company. All forms and shapes are produced, including strips, bars, rods and wire.

Bureau of Standards Seeking Uniform Hardening

An investigation into metal-hardening practices is being conducted by the Bureau of Standards to provide a more closely graded set of characteristics of coolants. Present-day practice is based largely on the use of oils, water and the faster aqueous solutions as sodium chloride brines, sodium hydroxide solutions and water sprays. A wide gap exists between cooling rates of quenching in oils and those with water and the Bureau is investigating, among other things the use of hot aqueous solutions. Some of the most promising now being studied are: 5% caustic soda at 20 deg. C; 5% salt at 20 deg.; 5% caustic soda at 60, also 5% sale and water; 5% caustic soda at 80 and at 85 or 90 deg. C.

Societies Cooperate on Screw Stock

The Society of Automotive Engineers and the Amer. Society for Testing Materials have begun joint consideration of the requirements for Bessemer screw stock contained in the S. A. E's standard specification A108-27.

Wire Bars From Secondary Copper

(*Continued from page 411*)

oughly before use. This retards "burning" of the steel by the hot copper and prevents the copper from freezing tight to ladle. Two ladles are used, the first half of the charge with one, the second half with the other.

Molds for Wire Bars

The molds used are made of copper and are cast at the refinery. They are made by filling a steel box with tough pitch copper, then forcing a solid steel core into the molten metal and allowing the metal to solidify around the core. When the core is withdrawn its impression remains in the mold. Eccentric lugs cast on each end are used to support the mold in a horizontal and upright position on the cooling water tank without tipping over. A steel pipe insert cast in one end of the mold is the socket for the rod used in turning the mold over to dump the solidified wire bar into the water. During the casting operation 3 or 4 in. of the bottom of each mold rests in water, thereby allowing heat to be conducted from mold to water, increasing life of the mold.

(*Concluded in January issue*)

Polymet Mfg. Co., owner of the Strand & Sweet Co. of Winsted, Conn., reports that unfilled orders now on hand exceed $2,000,000. This concern supplies essential wire parts to perhaps 80% of the larger radio firms.

Standard Radio Corp., Worcester, Mass., has gone into bankruptcy and a number of wire firms are listed among the more-than-100 unsecured creditors. Some of these are Acme Wire Co., New Haven; Wheeler Insulated Wire Co., Bridgeport; Chase Brass & Copper Co., Waterbury, and other Connecticut firms.

Wallace Barnes Co., Bristol, Conn., wire spring manufacturers, recently announced that shipments during the first six months of 1929 exceeded the same period of 1928 by 40%.

"PREMIER"
Trade Mark Reg. U. S. Pat. Off.

Diamond Die USERS Report

- - - - *Less interrupted production*
- - - - *Less repair work*
- - - - *Less replacements*

You, too, can get these same results by using "Premier" Diamond Dies—The dies that draw true to expectation any metal in any size suited to Diamond Die Drawing.

Write us for further information.

DRIVER-HARRIS COMPANY
HARRISON, NEW JERSEY
Chicago - Detroit - Morristown, N.J. - England - France
Alloy Makers since 1899

WIRE DRAWING
Machinery and Equipment
ROD FRAMES—16" FRAMES AND 8" FRAMES—TAKE-UP FRAMES
WIRE POINTERS—PULLER TONGS
General Castings For Wire Mill Use
CIRCULARS ON REQUEST
E. J. SCUDDER FOUNDRY & MACHINE CO.
TRENTON, N.J.

DIAMOND DIES
OF QUALITY
PERFECT PERFORMANCE AND DURABILITY
SELECTED DIAMONDS—GUARANTEED WEIGHTS
MANUFACTURED BY
Atlas Wire Die Company
100 Fifth Avenue New York

URDIKA

ELMARID

The most improved metal composition die.

Manufactured in sizes ranging from .020" to .250"

STEEL SET

DIAMOND DIES

Highest Quality

Accurate Size Smooth Draw

URDIKA
WIRE DIE WORKS

129 Fulton Street New York City

Anaconda Wire & Cable Co., subsidiary of Anaconda Copper Mining Co., has acquired assets and business of the Marion Insulated Wire & Rubber Co., Marion, Ind., giving this concern a plant for the manufacture of rubber-covered wires and cables, as well as its first Middle Western unit.

Hudson Wire Co., Ossining, N. Y., has let contracts for the erection of a new building 99x125 adjacent to its present brick buildings on Water Street and for equipping with modern wire-drawing machinery. This firm specializes in the finer sizes and grades of wire for magnets and other purposes, in all metals.

Ludlum Steel Co., Watervliet, N. Y., which recently purchased the Atlas Steel Corp., Dunkirk, N. Y., and which has the American rights for a number of German products, mainly of the famous Krupp concern, has just negotiated the exclusive rights for the Darmstadt machines covering the drawing of all kinds of metals. At first the contract with the Darmstadt Wire Drawing Corp. covered only the drawing of steel wire. Darmstadt wire-drawing equipment has now been installed in the Dunkirk plant and recently was put into operation. This firm is progressing rapidly with Nitroloy, steel surface hardened by contact with ammonia gas, in strips, bars and wire.

Western Electric Co. is one of the many firms participating in a huge expansion program in Baltimore, Md., and vicinity. The Western Electric plant at Point Breeze has the first unit nearly completed. The whole project is said to involve some $24,000,000. The first unit, by far the largest within the corporate limits of the city, will be ready for production before the end of 1929, and includes a wire-drawing plant embodying the most modern ideas along those lines, even more modern than the Hawthorne, Ill., plant completed and put in operation about three years ago.

BUYERS' GUIDE

For more complete information, consult the annual Directory, Index & Buyers' Guide.

ANNEALING SALTS
European Color & Chemical Co., Weehawken, N. J.

ANNEALING POTS
Columbiana Boiler Co., Columbiana, O.

BAKERS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

BLOCKS—Form Drawing and Shearing
J. A. Holmquist, Sharon, Pa.

CLEANING COMPOUNDS
Oakite Products, Inc., N. Y.

CRANES
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

DIAMONDS—Industrial
Abr. Levine, New York

DIES—Chilled Iron
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Diamond
Atlas Wire Die, Co., New York, N. Y.
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Bellet & Bouvard, N. Y.
Cochaud Wire Die Co., New York.
Driver-Harris Co., Harrison, N. J.
F. Krause & Co., Inc., Jersey City, N. J.
Master Wire Die Corp., New York, N. Y.
Union Wire Die Corp., New York, N. Y.
Urdika Wire Die Co., N. Y. C.
Vianney Wire Die Works, New York.
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Repairs & Re-Cutting
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Bellet & Bouvard, N. Y.
Cochaud Wire Die Corp., New York.
F. Krause & Co., Inc., Jersey City, N. J.
Urdika Wire Die Co., N. Y. C.
Vianney Wire Die Wks., N. Y.

DRAWING COMPOUNDS
Oakite Products, Inc., N. Y.

FURNACES—Wire Annealing
Bellis Heat Treating Co., Branford, Conn.
Strong, Carlisle & Hammond, Cleveland, O.
Vaughn Machinery Co., Cuyahoga Falls, O.

GALVANIZING ENGINEER
W. K. Spowers, Jr., New York, N. Y.

GALVANIZING LADLES, PANS, POTS
Columbiana Boiler Co., Columbiana, O.

GAUGES—Wire
A. Waldeck & Co., Cleveland, Ohio.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

LUBRICANTS—Wire Drawing
R. H. Miller & Co., Homer, N. Y.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
Mossberg Pressed Steel Corp., Attleboro, Mass.

MACHINERY—Bundling
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson.

MACHINERY—Cable
Watson Machine Company, Paterson, N. J.

MACHINERY—Cutting
American Insulating Mach'y Co., Phila., Pa.
Hallden Machine Co., Torrington, Conn.
Lewis Machine Co., Cleveland, O.
F. B. Shuster Co., New Haven, Conn.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Coiling
Broden Const. Co., Cleveland, O.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Chain Making
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Forming
Sleeper & Hartley, Inc., Worcester, Mass.
M. D. Kilmer & Co., Cleveland, Ohio.

MACHINERY—Galvanized Wire
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Hot Coat Tumbling
J. A. Holmquist, Aliquippa, Pa.

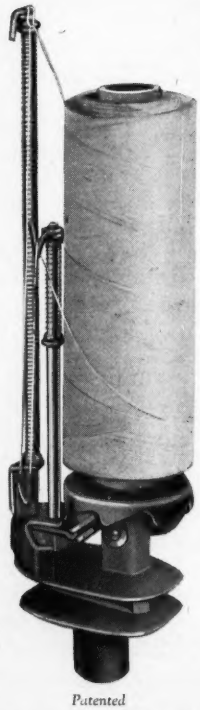
MACHINERY—Insulating
American Insulating Machinery Co., Phila.
New England Butt Co., Providence, R. I.

MACHINERY—Measuring Wire
New England Butt. Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

MACHINERY—Nail
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Panning
American Insulating Machinery Co., Phila.

Mosspeed Braider Carriers



Patented

make of the Maypole Type of Braider an Effective High Speed Braider

WITH Mosspeed Carriers the braiding speed may be increased up to 75%. This is made possible by better take-up through the use of springs instead of weights. Add to this speed a firmer braid, a decided saving in yarn, and you have the reasons why Mosspeeds are replacing other carriers throughout the wire industry.

Mosspeed Carriers are made of carbon steel carefully tempered, and are machined to fit.

MOSSBERG
PRESSED STEEL CORP.
Attleboro --- Massachusetts --- U. S. A.
Greenville, S. C. Dallas, Texas

Selson Engineering Company, Ltd.
26-28 Charles St., London, E. C. 1

BUYERS' GUIDE, Continued

MACHINERY—Pointing
Morgan Construction Co., Worcester, Mass.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rivet
The Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Screw Wire
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Spooling
American Insulating Machinery Co., Phila.
The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Spring Making
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Hallden Machine Co., Torrington, Conn.
Lewis Machine Co., Cleveland, O.
F. B. Shuster, New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Stranding
American Insulating Mach'y Co., Phila Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Sleeper & Hartley, Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrell Foundry Machine Co., Waterbury, Conn.

MACHINERY—Taping
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt. Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

MACHINERY—Testing
Riehle Bros. Philadelphia, Pa.
Henry L. Scott Co., Providence, R. I.

MACHINERY—Trolley Wire
The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Winding
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Drawing
American Insulating Machinery Co., Phila.
Broden Const. Co., Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
The Torrington Manufacturing Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY — Wire Forming Second-hand
Jesse Atherton, Providence, R. I.

MACHINERY—Woven Wire Fence
John A. Holmquist, Alequippa, Pa.

MACHINERY—Magnet Wire Enameling
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
New England Butt. Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

NEUTRALIZING COMPOUNDS
Oakite Products, Inc., N. Y.

PATENTS
Lancaster & Allwine, Washington, D. C.

POTS—Annealing
Columbiana Boiler Co., Columbiana, O.

REELS—Annealing
American Pulley Co., Philadelphia, Pa.
Apco-Mossberg Co., Attleboro, Mass.
R. B. Hayward Co., Chicago, Ill.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

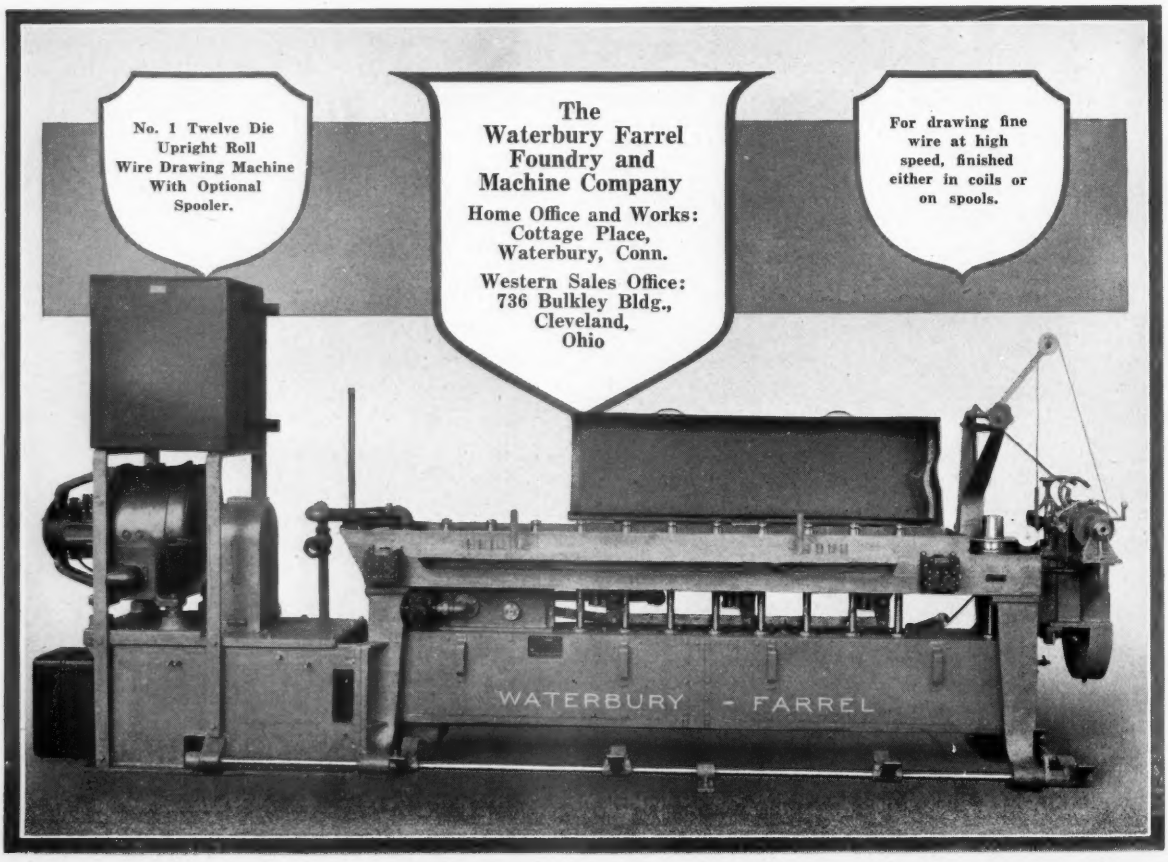
SOAPS—Wire Drawing
R. H. Miller Co., Homer, N. Y.

SPOOLS—Wire & Cable
American Pulley Co., Philadelphia, Pa.
Apco-Mossberg Co., Attleboro, Mass.
R. B. Hayward Co., Chicago, Ill.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIPPERS—Wire Block
J. A. Holmquist, Aliquippa, Pa.

TRUCKS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in WIRE & WIRE PRODUCTS. Please mention WIRE when writing to these firms.

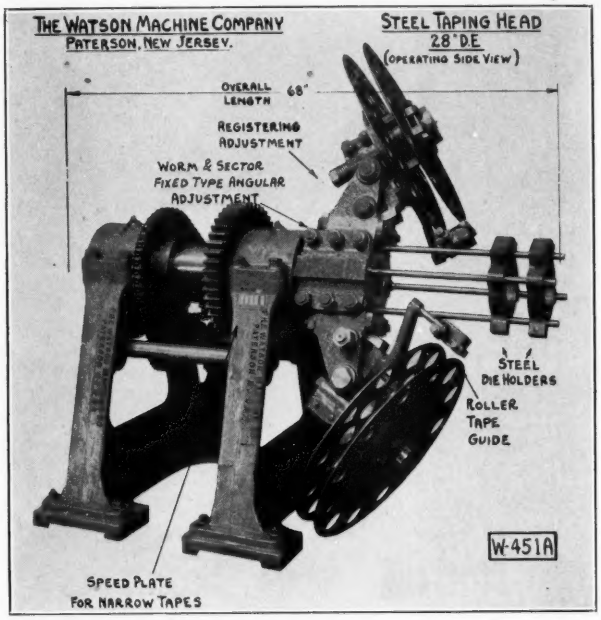

No. 1 Twelve Die Upright Roll Wire Drawing Machine With Optional Spooler.
The Waterbury Farrel Foundry and Machine Company
Home Office and Works: Cottage Place, Waterbury, Conn.
Western Sales Office: 736 Bulkley Bldg., Cleveland, Ohio
For drawing fine wire at high speed, finished either in coils or on spools.
WATERBURY - FARREL

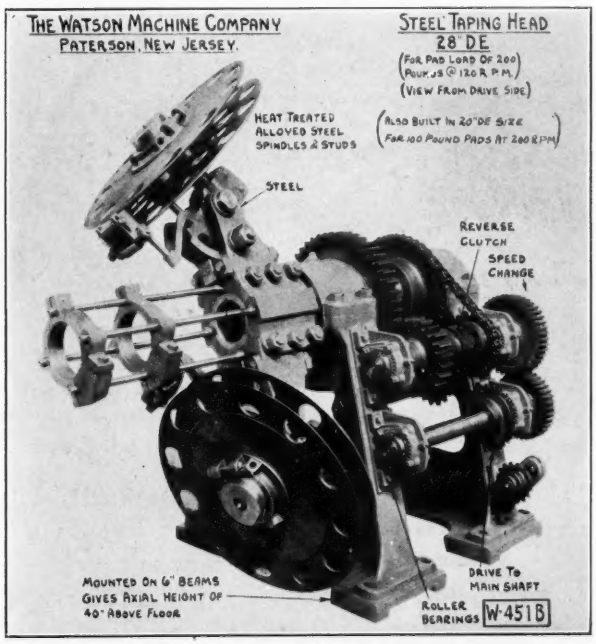
THE WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

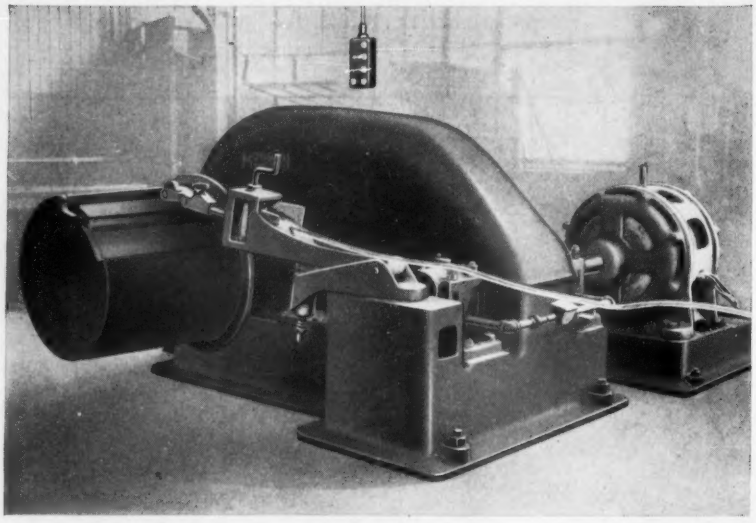
ENGINEERS - FOUNDERS - MACHINISTS

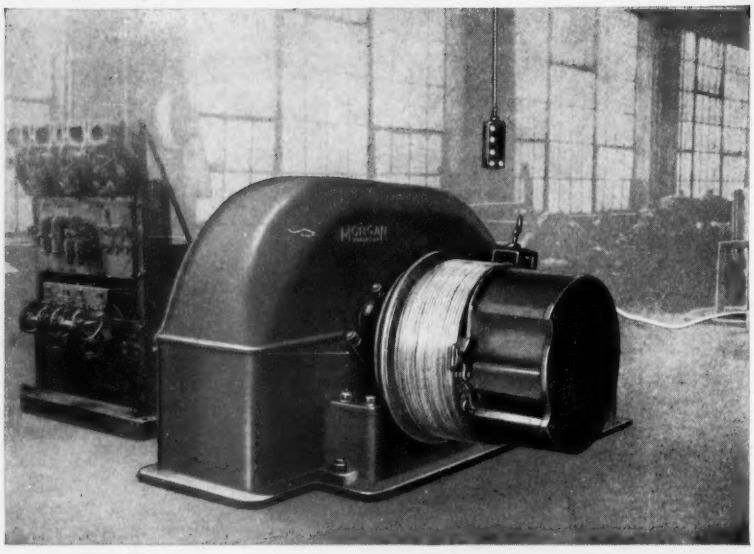



THE WATSON MACHINE COMPANY
PATERSON, NEW JERSEY.
STEEL TAPING HEAD
28" DE
(FOR PAD LOAD OF 200 POUNDS @ 120 R.P.M.)
(VIEW FROM DRIVE SIDE)
(ALSO BUILT IN 20" DE SIZE FOR 100 POUND PADS AT 200 R.P.M.)
HEAT TREATED ALLOYED STEEL SPINDLES & STUDS
STEEL
REVERSE CLUTCH
SPEED CHANGE
MOUNTED ON 6" BEAMS GIVES AXIAL HEIGHT OF 40" ABOVE FLOOR
DRIVE TO MAIN SHAFT
ROLLER BEARINGS
W-451B

ELECTRICAL WIRE AND CABLE
WIRE ROPE and CORDAGE MACHINERY

MORGAN BULL BLOCK





Handles cold drawn product from ½ inch to 1 inch round and equivalent sections in other shapes. The motor, transmission and drawing block are one unit. Machine is started, stopped, reversed and controlled in all its movements by push-button through a small pendent panel over the die box.

Morgan Construction Co., Worcester, Mass.

European Representative; International Construction Company
56 Kingsway, London, W. C. 2, ENGLAND

MORGAN
WORCESTER
ENGINEERS AND MANUFACTURERS